

**Comments**  
**Draft Lower Passaic River Study Area Baseline Human Health Risk Assessment**  
**Submitted June 2014 by the Lower Passaic River Study Area Cooperating Parties Group**

<b><u>No.</u></b>	<b><u>General Comment</u></b>
1	<p>Portions of the document highlight disagreements with EPA and, in some cases, reinterpretations of EPA's risk assessment Guidelines, Policies and Guidance that were previously addressed during the public and peer-review of EPA documents. EPA's review process is to release documents for public comment, go through external peer-review, respond to peer-review and public comments, and then finalize documents. It is inappropriate to reopen this process in a site-specific risk assessment such as that for the Lower Passaic River.</p> <p>Many issues, such as the fish ingestion rates, fraction ingested, and evaluation of cooking loss, were previously addressed in the dispute resolution. Other issues, such as the selection of toxicity values for PCBs and the non-cancer assessment for dioxin, were addressed in the development of the IRIS chemical file. The document needs to concentrate on presenting information in a manner that is understandable to both the manager and stakeholders and not on introducing alternative views of risk assessment. The restatement of disagreements addressed in the dispute resolution and also during public comments on EPA Guidelines, Guidance and Policies does not serve the purpose of the risk assessment and confuses the results of the analysis. The document will require extensive revisions to address this issue.</p> <p>Several instances of this concern are noted in the specific comments, but this issue should be addressed throughout the report.</p>
2	<p>Risk summary tables in the Executive Summary should present numerical risk estimates and not simply identify whether the potential risk or hazard index (HI) was greater than or less than NCP guidelines (i.e., cancer risks of <math>10^{-4}</math> and HI values of one). In addition, the risk summary tables in Section 6 should display this information more prominently (for example, the tables on Pages 6-6 through 6-24 should list numerical results). The degree to which NCP guidelines are exceeded is significant and should be presented and discussed in the main body of the report. The color-coding used to flag total risks and/or HIs that exceed guidelines is helpful and can be retained. Several areas of the report, particularly Sections 6.3 and 6.4, will need to be rewritten to address this.</p> <p>The approach taken in draft report of presenting risk information does not meet the requirements outlined in the Risk Characterization Handbook of transparency, clarity, consistency and reasonableness. Specifically, the audience for this document includes risk managers who will use the quantified cancer risks and non-cancer health hazards to inform the Feasibility Study (FS) and ultimately the Record of Decision (ROD). Another audience for this document is the public who are concerned about potential health impacts from exposures where a statement regarding the degree to which the cancer risks and non-cancer health hazards goals of protection are exceeded is important information.</p> <p>Consistent with the Risk Characterization Handbook (Section 2.3.2), the Risk Assessment Guidance for Superfund Part A (Exhibits 8.2 and 8.3 and Section 8.6 where the last bullet on page 8-25 calls for</p>

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	presenting “the magnitude of the cancer risks and noncancer hazard indices relative to the Superfund site remediation goals in the NCP (e.g., the cancer risk range of $10^{-4}$ to $10^{-7}$ and noncancer HI of 1.0;),” and RAGS Part D Tables (Instructions for Table 10 Risk Summary), the text and tables of the main body of the report need to clearly identify the calculated numerical cancer risks and non-cancer health hazards.
3	<p>The text in sections 6.3 and 6.4, entitled “Risk Characterization Results” and “COC Identification” provides no discussion of the risk characterization results and limited discussion of COCs to a couple of examples with pesticides and PAHs in a single paragraph. The text in these sections does not discuss the contribution of dioxins/furans or PCBs to the total risk estimates for this site.</p> <p>In addition, the relative percent contribution of risk from different contaminants, particularly dioxin TEQ and PCBs, as well as other risk drivers, should be listed in the Executive Summary and the Risk Characterization. For example, on Page ES-2, the last sentence of the paragraph on recreational and worker risks says that the “exceedance is due primarily to TCDD-TEQ.” This discussion should be expanded to include other contributors such as dioxins, PCBs and mercury.</p>
4	<p>The Executive Summary and other parts of the document provide information on two RME individuals, one who consumes all fish species and the other who consumes all fish species with the exception of carp. An assumed fish diet that excludes a type of fish known to be kept and consumed by some anglers at the site, and known to have elevated chemicals of potential concern (COPC) concentrations, does not represent an RME scenario, and should not be presented as such.</p> <p>A mixed diet that excludes carp should be removed from the report entirely, or presented in the uncertainty evaluation as a potential variation on the mixed fish diet that would most significantly alter the mixed diet RME risk estimates (as opposed to variations that remove one of the other species). Alternatively, the text of the uncertainty section can provide information on individuals consuming each species (i.e., cancer risks and non-cancer health hazards), to account for specific preferences. This information can then be compared to the risk range and goal of protection of an HI of 1.</p> <p>In addition, the RME scenario for crab ingestion should include the hepatopancreas along with the muscle and should not be included alongside discussion of a muscle-only diet. Again, any discussion of the changes in the risk estimates by excluding the hepatopancreas should only be included in the uncertainty section.</p> <p>In general, one RME scenario should be presented for each exposure pathway.</p>
5	The text continually emphasizes that the assumptions and risk assessment approach are conservative, resulting in overestimates of risks. The document should also acknowledge the potential that the risks and hazards are underestimated i.e., lack of toxicity data for a number of chemicals, use of surrogate data, use of high end values that are not the highest percentile, use of average exposure assumptions such as body weight, skin surface area, etc. The information should be presented in a way that recognizes the range of estimates used in the calculation of the cancer risks and non-cancer health hazards.

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6	<p>Sections 6.5 and 7 and Appendix L of the HHRA misrepresent the concentrations used in the risk calculations as “upper-bound” values. The concentration values used (i.e., 95 percent upper confidence limit of the arithmetic mean) are estimates of the arithmetic average concentration of each contaminant at the site accounting for uncertainties in the data, as accurately described in Section 4.</p> <p>Discussions of the Upper Confidence Limit (UCL) concentration statistic in Section 6.5 and Appendix L should be corrected, the “mean” scenario should be removed, and the “upper-bound” scenario should be correctly labeled as the RME scenario.</p> <p>Discussions of the UCL concentration statistic in Section 7 should be corrected, particularly on pages 7-46 and 7-49, where it is interpreted as a 95th percentile.</p>
7	<p>The term “non-cancer hazards” needs to be used consistently in place of non-cancer risks. Non-cancer hazards do not represent a probability of disease as do cancer risks. The use of the term risks for non-cancer health effects confuses the presentation of information and needs to be restated as non-cancer hazards consistently throughout the document.</p>
8	<p>Throughout the document the terms Chemicals of Potential Concern (COPC) and Chemicals of Concern (COC) are used interchangeably. A determination regarding COCs is finalized at the time of the ROD. Currently, the text provides this information in Section 6.4 but does not clearly indicate that the ROD is the point where the final determination is made. The term COPC should be used in the document and a section in the Risk Characterization should formally identify the COCs pending the finalization of the ROD.</p>
9	<p>The term “target” should be removed from the discussion of the risk range. The goal of the risk assessment is to provide information and not to set a goal of a specific cancer risk or non-cancer hazard. Use of the term “target” appears to suggest a specific risk or hazard goal in the risk assessment. Instead, please use the following language:</p> <ul style="list-style-type: none"> <li>a. Any cancer risk above <math>10^{-4}</math> should be said to “exceed the NCP risk range.”</li> <li>b. Any cancer risk between <math>10^{-4}</math> and <math>10^{-6}</math> should be said to be “within the NCP risk range.”</li> <li>c. Any HI above 1 should be said to “exceed the goal of protection of an HI=1.” The qualifier “slightly” should not be used.</li> </ul>
10	<p>The text regarding the inclusion of the Reasonable Maximum Exposure (RME) and Central Tendency Exposure (CTE) needs to clarify that the RME is the basis for any risk management decisions under the Superfund program. As currently presented, the text suggests decisions may be based on the CTE. RAGS Part A, Chapter 6, (page 6-5) states: Actions at Superfund sites should be based on an estimate of the <u>reasonable maximum exposure (RME)</u> expected to occur under both <u>current</u> and <u>future</u> land-use conditions. The reasonable maximum exposure is defined here as the highest exposure that is reasonably expected to occur at a site. RMEs are estimated for individual pathways.</p> <p>The text in several places appears to concentrate on population risks and hazards. Consistent with Superfund guidance and policies, the goal of the baseline human health risk assessment is to identify cancer risks and non-cancer health hazards for the RME individual.</p>

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	The entire document needs to be reviewed and modified to reflect these comments.
11	Throughout the document, the term “more realistic” is used to discuss either CTE exposures or alternative exposure factors. This term should be deleted. The CTE, or alternative exposure factors, might describe average exposures. However, RME exposures are realistic, albeit they likely apply to a smaller number of individuals.
12	Overall, the text requires revisions to concentrate on the main risk drivers with less emphasis on exposure parameters that are not significant drivers. The Uncertainty section also needs to concentrate on the main risk drivers. A table summarizing the main risk drivers and whether they contribute to the over or underestimate of risks/hazards for the main contributors is needed to concentrate on the most significant information. The current presentation provides extraneous information that does not focus on the most important results of the risk assessment. Overall, the risk characterization should focus on those exposures that are the primary risk drivers.
13	<p>The treatment of background throughout the report is inappropriate and is not consistent with risk assessment guidance or the more specific guidance on background, “Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites,” OSWER Dir. 9285.7-41, September 2002., which includes as Appendix B, “The Role of Background in the CERCLA Cleanup Program,” OSWER Dir. 9285.6-07P, May 2002.</p> <ul style="list-style-type: none"> <li>a. Background should not be discussed throughout the report. It should only be discussed in the risk characterization section, to put things in context. The background data should not be used to mitigate or otherwise detract from the risks posed by the site itself.</li> <li>b. The draft BHHRA did not test any hypothesis of whether site data and background data are the same. Rather, the report contains statements that “background levels of [some chemicals] contribute significantly to LPRSA risks” or “are comparable to LPRSA risks” (p. ES-2) without statistically supporting the statements. Similar statements are made elsewhere in the BHHRA: pp. ES-3, ES-9, ES-11, Section 6.5.2. EPA’s Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (September 2002, Chapter 5) recommends quantitative statistical approaches for comparing site data to background data. A statistical comparison of site data with background data should be performed before conclusions are made about whether site data exceeds or is comparable to background data, and before attributing specific fractions of the site risk to background (e.g., pages 6-30 through 6-34 of BHHRA). The Background Guidance (p. 3-1) notes “in comparisons with background the parameter of interest is... the amount by which the mean of the distribution of concentrations in potentially impacted areas exceeds the mean of the background distribution.”</li> <li>c. Finally, if you wish to include calculated risks from background fish or sediment concentrations, the background dataset should follow the same rules as the LPRSA dataset (e.g., only accessible sediment samples should be used to calculate the risks for sediment exposure). Note that the contribution of background sediment concentrations to concentrations below the dam should be evaluated in the Remedial Investigation (RI) or FS reports. This evaluation may include a larger set of data than that used for risk comparisons.</li> </ul>

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14	<p>An update to the Superfund Standard Default Exposure Factors was recently published in February 2014. The entire risk assessment should be updated using the new EPA guidance values. However, the value for Exposure Duration should be maintained as 70 years and not changed to 78.8 years based on the 2011 EFH. The basis for this decision is consistency with the toxicity values as outlined in the 2011 EFH Introduction.</p> <p>Please note we do not expect changes in these values to significantly affect the overall calculations of risk for this site.</p>
15	<p>The following general comment relates to the calculation of cancer risks and non-cancer health hazards from PCBs and Dioxins:</p> <p>RAGS Part D Tables 7 through 10, provide calculated cancer risks for total PCBs and dioxin-like PCBs but do not present information on non-dioxin like PCBs or total risks including both dioxin-like and non-dioxin like PCBs. In addition, the non-cancer health hazards associated with dioxin-like PCBs are not calculated.</p> <p>Page ES-5 of the draft BHHRA indicates that the evaluation was based on total PCB including both dioxin-like PCBs with the application of the 2010 Guidance and total PCBs without subtracting out the dioxin-like from the Total. Consistent with EPA's documents titled "Use of Dioxin TEFs in Calculating Dioxin TEQs at CERCLA and RCRA Sites" (2013 Guidance) and the "1996 Reassessment of PCB Cancer" (1996 Guidance), cancer risks and non-cancer hazards should be provided for Total PCBs, dioxin-like PCBs and non-dioxin like PCBs and dioxin TEQ (see Example 4 from the 1996 guidance).</p> <p>A Hazard Quotient should be calculated for dioxin-like PCBs since as stated in the document Use of Dioxin TEFs, "the toxicokinetics and toxicodynamics for all DLCs are similar and act by a common toxic mode of action". Therefore, the calculation of non-cancer HQ for dioxin-like PCBs should be provided in the table and summed with the calculated hazards for non-dioxin like PCBs.</p> <p>The RAGS Part D Tables should provide calculated EPCs and associated cancer risks and non-cancer HQ for dioxin-like and non-dioxin like PCBs, and total PCBs, consistent with the 1996 Guidance – Example 4. Further these calculated risks and non-cancer hazards from the dioxin-like and non-dioxin like PCBs should be combined to calculate the total cancer risks and non-cancer health hazards. The Uncertainty Section of the report may discuss the potential double counting of the cancer risks for the non-dioxin like PCBs indicating the limited knowledge regarding the percent of dioxin-like PCBs in the Aroclor mixtures tested in the animals that were used in the derivation of the Cancer Slope Factor with appropriate citations to the paper by Cogliano, V.J. Assessing the Cancer Risks from Environmental PCBs. <i>Environmental Health Perspectives</i> 106(6): 317-323, 1998. In addition, the text in the Uncertainty Section can describe differences between the calculated total PCBs and dioxin-like and non-dioxin-like PCBs (e.g., enhancement of the risks and hazards from the dioxin-like PCBs) as an uncertainty.</p> <p>Example of Presentation of Information:</p>

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	COPC	Cancer Risk	Non-cancer HI	Note
	Total PCBs	$5 \times 10^{-4}$	15	Presented for information but not included in the calculation
	Dioxin-like PCBs	$1 \times 10^{-4}$	3	
	Non-Dioxin Like PCBs	$3 \times 10^{-4}$	12	
	Total Dioxin-Like/Non-Dioxin Like PCBs	$4 \times 10^{-4}$	15	Include this value in the total for all Chemicals
	Dioxin TEQ	$1 \times 10^{-3}$	25	
	The total calculated risks for all chemicals would include dioxin-like PCBs and non-dioxin like PCBs and the Uncertainty Section would discuss whether the analysis found enhancement of the dioxin-like PCBs and the uncertainties associated with the cancer slope factor based on the paper by Coglianò listed above.			
16	<p>The following general comments all relate to PCBs:</p> <p>a. The report needs to be edited to indicate EPA's classification of PCBs as a Probable Human Carcinogen. Any discussion indicating there is no evidence of cancer from exposure to PCBs should be removed. The text should use the language provided under the Classification of Carcinogens section of the PCBs IRIS file. This comment applies primarily to Sections 5.1, 5.6.2.1, and 7.3.2.1, though other instances may appear.</p> <p>The IRIS chemical file for PCBs includes a Weight of Evidence classification for PCBs of Probable Human Carcinogen. This classification, which was made in 1996, was based on human studies that were being updated, and indicated at that time that the currently available evidence was inadequate but suggestive. More recently, the International Agency for Research on Cancer (IARC) classified PCBs as Group 1, Carcinogenic to Humans, based on the conclusions of an IARC convened panel. These conclusions are presented in a paper in The Lancet Oncology, Volume 14, Issue 4, Pages 287 - 288, April 2013. The report was published online on March 15, 2013, and can be found at: <a href="http://www.iarc.fr/en/media-centre/iarcnews/index1.php?year=2013">http://www.iarc.fr/en/media-centre/iarcnews/index1.php?year=2013</a>.</p> <p>In addition, the National Toxicology Program has classified PCBs as reasonably anticipated to be carcinogenic to humans. This classification can also be provided in the text to represent the range of classifications from different organizations</p> <p>b. The rationale for screening individual PCB congeners and dioxins/furans against respective screening levels should be provided since total PCBs and total dioxin and furan TEQ were already included in Tables 3-8 to 3-10.</p> <p>c. It appears that the co-eluting PCB congener list in Table 3-7 was applied across all sampling events and should not be because co-eluting PCB congeners differ by sampling event. Thus, the same list should not be used for all total PCB calculations. Based on the electronic data received from the CPG in 2012 for task code 12A and analytical data presented in Appendix A, some of the PCB congeners identified as co-eluting list different result values for the</p>			

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	<p>individual congeners. For example, in both Appendix A and electronic data file, results for sample 12A-0401-C2AS listed PCB-110 as 0.0211 mg/kg and PCB-115 as 0.000397 mg/kg. PCB-110 and PCB-115 are listed as co-eluting PCBs on Table 3-7; however, they have two different results and are not identified as being co-eluting PCBs in the electronic data file received for task 12A. Thus, the total PCB concentration cannot be verified since the co-eluting PCBs are different between individual sampling events. Table 3-7 should be revised to include co-eluting PCB congeners for each sampling event.</p> <p>In addition, please use the agreed procedure to identify co-eluting PCB congeners. A qualifier code of "C###" should be included to identify co-eluting PCB congeners in data presentation in Appendix A. Consequently, the subsequent tables listing that "the co-eluting PCB congeners are not shown in the COPC screening tables" should be revised since the co-eluting PCB congeners differ by sampling events.</p>

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
17	List of Acronyms	By spot checking, it is noted that this list is not complete, such as AOC, TERA. Please make sure it is complete.
18	Executive Summary	As noted in the overall comments, the Executive Summary provides comparisons to the risk range established under the NCP without specifically stating the calculated cancer risks and non-cancer health hazards. Tables specifically identifying the calculated cancer risks and non-cancer health hazards along with the main COPCs that contribute to the total risk and hazard should be included, for both the RME and CTE scenarios. In addition, the text of Section ES.1 should include the calculated cancer risks and non-cancer health hazards. Finally, the Executive Summary should focus on those risks above and within the NCP risk range and the non-cancer health hazards above the goal of protection of an HI of 1. Other risks and hazards not meeting these criteria can be briefly summarized in the Risk Characterization portion of the document.
19	Executive Summary	<p>When summarizing risks and hazards, both in the Executive Summary and elsewhere in the document, please use the following guidelines:</p> <ol style="list-style-type: none"> <li>Any cancer risk greater than <math>10^{-4}</math> should be said to "exceed the NCP risk range."</li> <li>Any cancer risk between <math>10^{-4}</math> and <math>10^{-6}</math> should be said to be "within the NCP risk range."</li> <li>Any HI above 1 should be said to "exceed the goal of protection of an HI=1." The qualifier "slightly" should not be used.</li> </ol>

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		<p>d. Calculated risks and non-cancer hazards should be specifically stated for both the RME and CTE scenarios.</p> <p>For example, based on these guidelines, we suggest Bullet 1 on Page ES-1 be rewritten as:</p> <p>"Based on the reasonable maximum exposure (RME) scenario, the cancer risk to a recreational angler on the LPRSA consuming a mixed species fish diet exceeds the NCP risk range of <math>10^{-4}</math> to <math>10^{-6}</math>. The cancer risks to the RME individual are [insert calculated risk] for the adult, [insert calculated risk] for the young child, [insert calculated risk] for the adolescent, and [insert calculated risk] for the young child/adult."</p> <p>Bullet 2 can be rewritten as:</p> <p>"The non-cancer hazards to the RME recreational angler on the LPRSA consuming a mixed species fish diet exceed the goal of protection of a Hazard Index (HI) equal to 1. The non-cancer health hazard is [insert calculated HI] for an adult angler, [insert calculated HI] for an adolescent and [insert calculated HI] for the young child consuming fish caught from the LPRSA."</p>
20	Executive Summary, Page ES-1	As noted in the overall comments, the 3 <sup>rd</sup> bullet on Page ES-1 should be deleted.
21	Executive Summary, Page ES-2	<p>Under crab consumption:</p> <ol style="list-style-type: none"> <li>Language in the first and second bullet should be modified as noted in Specific Comment 19.</li> <li>The 3<sup>rd</sup> bullet should be deleted. This information can be discussed in the uncertainty section</li> <li>The word slightly should be removed from the 4<sup>th</sup> bullet. The word slightly should be removed throughout the document as a modifier to the HI calculated.</li> <li>In the 4<sup>th</sup> bullet, muscle-only results should not be discussed here; they should be discussed in the uncertainty section only. Note that, according to Table 6-6, the CTE non-cancer hazard index for a diet of crab muscle only is 1, not below 1.</li> </ol>
22	Executive Summary, Page ES-2	The section called "Influence of Background Conditions on Risk" should be renamed "Background Evaluation" and the language will need to be revised based on comments contained herein. In addition, a table may more clearly convey the information than text.



<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
23	Executive Summary, Page ES-4, Section ES.2.2	<p>a. At the end of the 3<sup>rd</sup> sentence of the 2<sup>nd</sup> paragraph, add the phrase “though homeless groups have been observed along this stretch of the river.”</p> <p>b. The 2<sup>nd</sup> paragraph should note the presence of several residential properties on the eastern bank with yards that abut the river, perhaps at the end of the sentence that mentions parks and bathhouses above RM 7.</p> <p>c. Please check whether the reference in the paragraph before the bullets should be to the 2009 Problem Formulation Document, not the CSM.</p> <p>d. The last paragraph on this page should highlight that all decisions will be based on Reasonable Maximum Exposures.</p>
24	Executive Summary, Page ES-7, Table	<p>The table lists exposure to the surface water pathway as incomplete for the adult worker. Please change this to not quantified, and add a footnote stating that adult workers could include fire/rescue squads that may be exposed to the surface water, but their risks would be less than the risks quantified for an adult swimmer.</p> <p>EPA understands this is a departure from the RARC Plan. However, we do receive calls about this exposure pathway from time to time and think it is worth noting in the document.</p>
25	Page ES-9, Last sentence	Please add in parentheses “approximately 30 meals of 6 crabs per year” instead of “approximately 170 crabs per year.”
26	Page ES-10, Second sub-bullet	Remove the phrase after the semicolon related to carp and replace with “however, a diet that includes any individual fish species was found to exceed both the NCP risk range and the goal of protection of an HI=1 under the RME scenario. Further, a diet that includes any individual fish species was found to be within or exceed the NCP risk range and exceed the goal of protection of an HI=1 under the CTE scenario .
27	Page ES-11, Last sentence	This sentence should be deleted. It is not appropriate here (“The contribution of background....”).
28	Page 1-1, Section 1.0, 2 <sup>nd</sup> Paragraph	It is unclear why risk management guidance is identified in addition to the risk assessment guidance listed in first paragraph. The risk assessment should inform the risk management decision and inclusion of this risk management guidance is not appropriate.

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29	Chapter 1. Page 1-3	<p>The following updates are needed:</p> <ul style="list-style-type: none"> <li>• ProUCL 5.0 is the current version of the software and should be added to the bulleted list on this page.</li> <li>• Child-specific Exposure Factors Handbook (USEPA 2008b) was replaced with the 2011 version of the Exposure Factors Handbook (2011 EFH), though all values for the child remain the same. All references to this document should be updated throughout the report to reflect EFH 2011.</li> <li>• Regional screening levels were updated in 2015 and require updating to reflect the latest version expected to be available in May and November.</li> <li>• As noted in the general comments, updated exposure factors were published in February 2014 by OSWER and should be used, though exposure duration should be maintained at 70 years for consistency with the toxicity values. Also note, the surface area factors for adults and children were recently updated after the February 2014 publication, and these values will need to be updated in the text and tables as well.</li> </ul>
30	Page 2-1, Section 2.1	Remove the last sentence of the 2 <sup>nd</sup> paragraph. This is a CERCLA risk assessment and the statement is not necessary.
31	Page 2-2, Section 2.1.1, 1 <sup>st</sup> Paragraph	References to the LPRSA being part of the Diamond Alkali site are fine, but the first paragraph should not focus solely or even primarily on the upland portion of the site. The discussion of the upland facility should be condensed and more discussion of the contributions to the 17 miles should be included, potentially in the third paragraph. References to the operable units should be omitted.
32	Page 2-2, Section 2.1.1, 2 <sup>rd</sup> Paragraph	Update the discussion to include information regarding the removal action at RM 10.9.
33	Page 2-2. Section 2.1.1, 3 <sup>rd</sup> Paragraph	<ol style="list-style-type: none"> <li>a. The text here mentions only sediment chemistry data for the LPRSA and sediment, surface water and tissue data for areas outside the LPRSA. The presence of contaminants in surface water and tissue samples from the LPRSA should also be noted.</li> <li>b. Briefly expand the discussion to include some description of the types of discharges that have contributed to the presence of other contaminants in the river (i.e., there are many facilities along the river that have contributed contamination).</li> </ol>

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		c. The last sentence of this paragraph should also be deleted.
34	Page 2-3, Section 2.2, Table	Please verify that the referenced source of the land use data is the most up to date available.
35	Page 2-3, Section 2.2.1	The section about the upper river (Section 2.2.2) mentions master plans. Please also cite to master plans for the municipalities in this portion of the river.
36	Pages 2-3 to 2-4, Section 2.2.2	The master plans mentioned in this section should be referenced in the correct portion of the river. For example, reference to actions near the Sherwin Williams site should be discussed in Section 2.2.1.
37	Page 2-3, Section 2.2.1	Please add language to the end of the last paragraph of this section mentioning that while access is limited, homeless groups have been observed and docks and other potential access pathways are present along this stretch of the river from which workers may fish and/or crab.
38	Pages 2-4 to 2-5, Section 2.3	<p>The designated uses for all water classified by NJDEP as SE3 are (<a href="http://www.nj.gov/dep/rules/rules/njac7_9b.pdf">http://www.nj.gov/dep/rules/rules/njac7_9b.pdf</a>):</p> <ol style="list-style-type: none"> <li>1. Secondary contact recreation;</li> <li>2. Maintenance and migration of fish populations;</li> <li>3. Migration of diadromous fish;</li> <li>4. Maintenance of wildlife; and</li> <li>5. Any other reasonable uses.</li> </ol> <p>“Secondary contact recreation” means recreational activities where the probability of water ingestion is minimal and includes, but is not limited to, boating and fishing. The definition may include swimming in the future.</p> <p>The NJ reference provided above should also be used to further describe definitions for FW2-NT and SE-2 classified waters.</p>
39	Pages 2-4 to 2-6, Section 2.3	a. The general statement in the second paragraph on page 2-5 (and throughout the document including section 4.1) that “Under current conditions and in the reasonably foreseeable future, recreational activities generally involve those with low potential for direct contact with river sediment and surface water” should be revised. As per the RARC, all of the exposure pathways are currently complete, and local and municipal plans to increase access to the river will likely increase the number of individuals utilizing the river in the future.

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		<p>b. In addition to sculling activities, this section notes that use of canoes and kayaks are occasionally observed. Please also note the ongoing development of a National Park Service water trail from upper reaches of this river, down to Newark Bay (Lower Passaic Canoe and Kayak Trail Action Plan, 2007, National Park Service).</p> <p>c. Remove or revise last sentence of this section which states: "The LPR surveys indicated that potential consumption of LPRSA fish and/or crab by local anglers is limited."</p>
40	Page 2-5, 2 <sup>nd</sup> full paragraph	<p>Please revise and combine the 3<sup>rd</sup> and 4<sup>th</sup> sentences of this paragraph as follows:</p> <p>Although the state's classification of the freshwater portion of the river (from the confluence with Second River to Dundee Dam) includes swimming as a designated use, there are currently no public beaches or designated swimming areas on the river. As such, the occurrence of swimming under current conditions is expected to be limited.</p>
41	Page 2-6, Section 2.3.1, Footnote 9	The potential exists that individuals may travel to fish in both Newark Bay and the LPRSA. In addition, fish move within this system. As such, the use of the Burger 2002 survey is appropriate and can be considered site specific.
42	Pages 2-7 to 2-8, Section 2.3.1.1	<p>This section needs to be revised to reflect the facts that EPA did not approve the work plan for this survey and the results of the survey have not been published or made fully available to EPA for review. Throughout the document, references to the survey can be made anecdotally (i.e., people were observed fishing), but not quantitatively. In addition, the study description should briefly discuss the uncertainties associated with this survey.</p> <p>Please send us revised language for review prior to finalizing the next draft.</p>
43	Page 3-1, Section 3.1, Second paragraph, 1 <sup>st</sup> sentence	Provide a reference to the state validation guidelines mentioned in the text, with appropriate citation.
44	Page 3-2, Section 3.1.1	Language needs to be added to the discussion of accessible sediments. Concentrations of contaminants in sediment that meet the definition of accessible sediment will change over time. A brief comparison of concentrations in the 143 samples used to calculate Exposure Point Concentrations (EPCs) should be made to the surrounding sediment concentrations, both horizontally and vertically. Reference to other documents where this issue is explored in more detail (such as modeling reports and the RI) can be made. This discussion can be included here and/or in the uncertainty section.

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
		Please modify the last sentence of the paragraph after the bullets in this section as follows, "These areas were excluded because the accessible sediment has been dredged and capped or filled, thereby interrupting the exposure pathway."
45	Page 3-2. Section 3.1.1. Paragraph 3.	Indicate how the data from the supplemental sampling will be incorporated into the final report.
46	Page 3-2 through 3-3, Section 3.1.1	<p>EPA would like to complete a thorough review of all samples used in the draft HHRA. As such, please provide more details plus the excel table(s) showing the data used. This is not necessarily for inclusion in the report, but rather to aid in our review.</p> <p>These tables should include the SSP2 and surface water results that are now available, along with an updated list/count of samples used, updated data summary tables (such as Table 3.8) and an updated list of COPCs (if necessary).</p> <p>Further, the revised report should clearly list in figures and tables which samples are being used and in which sections of the river they are located.</p>
47	Page 3-5, Section 3.1.3	The discussion of alternate fish species should explain why the QAPP included alternates.
48	Pages 3-6 to 3-7, Section 3.2.1	<ul style="list-style-type: none"> <li>a. A description of the treatment of rejected data should be added to this section.</li> <li>b. Consistent with RAGS Part D a work sheet describing the QA/QC of data and its usability for the BHHRA should be provided.</li> <li>c. The text describing the evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) should use the term "relative potency factors" and not Toxicity Equivalency Factors (TEFs). The process used for deriving TEFs and the underlying science are significantly different from Relative Potency Factors (RPFs). EPA understands that the draft final version of the Data Usability Memo (dated 5/15/2014) uses the TEF language; this was an oversight on our part and should be corrected in the final document.</li> </ul>
49	Page 3-8, Section 3.3.1	The reference to Risk Assessment Guidance for Superfund, Part A should be USEPA 1989b and not USEPA 1989.

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
50	Page 3-8, Section 3.3, Point 4	<p>The RAGS Part D Table 2 series will need to be evaluated to reflect the latest Regional Screening Levels at the time the document is finalized.</p> <p>Attached are surrogate values from the Superfund Technical Support Center. The text will need to be updated to reflect these values and tables will need to be updated to reflect the recommendations from STSC. The uncertainties will need to be addressed in the Uncertainty Section of the report.</p>
51	Page 3-9, Section 3.3.4	<p>Change the phrase at the end of the last sentence of the 2<sup>nd</sup> paragraph of this section to state, "which is higher than the consumption rate used for the LPRSA risk calculations."</p>
52	Page 3-10, Section 3.4	<ul style="list-style-type: none"> <li>a. The text needs to clarify whether inorganic arsenic was maintained as a COPC for crabs.</li> <li>b. The discussion of removal of chemicals based on 5% or less of samples requires clarification. If a chemical was detected above the screening level in greater than 5% of samples then it should be retained as a COPC.</li> <li>c. The last bullet should be updated to reflect the new screening level of 0.24 mg/kg.</li> </ul>
53	Page 3-11, Section 3.4, 2 <sup>nd</sup> paragraph, 3 <sup>rd</sup> bullet	<p>COPCs for fish tissue differ by species. This approach is appropriate for estimating risks for a single-species diet. However, the same set of COPCs should be used across species for the purposes of EPC calculation for mixed diets.</p> <p>From the tables in Appendix H, it appears that EPCs were not actually calculated for the mixed diets. Rather, risks were calculated by species including a diet fraction factor of 25% or 20% in the exposure equations for each species. So if a COPC was not identified for that fish species it was not included in the risk estimate for that portion of the diet, or basically had an assumed concentration of zero in that portion of the diet. Since the concentration in that species could have been just below the risk screening level, the approach taken in the HHRA underestimates the risks associated with mixed fish diets.</p> <p>Across all fish species, 27 COPCs were identified. Only eight of them were COPCs for all species (as shown in Table 3-12). These eight COPCs included the HHRA risk drivers (e.g., PCDDs/PCDFs, PCBs, dieldrin, methyl mercury) so the most significant risks in the HHRA were not impacted by this issue. However, additional COCs may be identified if the other 19 COPCs are evaluated for all species.</p>

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
54	Page 3-11, Last paragraph	Please delete this paragraph.
55	Pages 4-1 to 4-5, Section 4.1	<p>The following language from the RARC should be incorporated into this section:</p> <p style="padding-left: 40px;">In accordance with USEPA Guidance (USEPA 1989b, USEPA 2001b), the scenarios and exposure parameter assumptions are intended to capture exposures under both current and future site conditions. All of the exposure pathways are currently complete. While expected improvements to the river and shoreline will likely increase the number of individuals utilizing the river, the exposure frequency and duration for some individuals already utilizing the river will not likely increase. As such, the use of combined current/future exposure assumptions is appropriate.</p> <p>In addition, the entire document should be reviewed for consistency with this approach.</p>
56	Page 4-2, Section 4.1, Last paragraph	<p>Please remove the 2<sup>nd</sup> and 3<sup>rd</sup> sentences from this paragraph.</p> <p>Provide a listing of the latest land use guidance references. References are available at <a href="http://www.epa.gov/superfund/programs/recycle/pdf/reusedirective.pdf">http://www.epa.gov/superfund/programs/recycle/pdf/reusedirective.pdf</a>.</p>
57	Page 4-5, Table	Under Current/Future Angler, young children are only consuming fish tissue, however, in Section 4.3.1 the young child is assumed to consume fish and/or crab. Please reconcile.
58	Page 4-8, Section 4.2.2, second equation	Change the formula for "t*" from "2.4t" to "2.4T"
59	Page 4-9, Section 4.3	At the end of the 2 <sup>nd</sup> paragraph, the text should clarify that the RME individual is the basis for decisions under the NCP.
60	Page 4-10, Section 4.3.1	The discussion regarding exposures through fish/crab ingestion in the lower 4 miles should include the potential that workers on commercial/industrial properties may fish/crab from the locations.

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
61	Page 4-11, Section 4.3.1, 2 <sup>nd</sup> paragraph	Add "(adolescent and adult only)" to the end of second and third bullets since exposure of a young child angler to sediment and surface water is not evaluated.
62	Page 4-11, Section 4.3.2	Please delete the second to last sentence on the page ("Any swimming in the river is likely to be..."). This is speculation.
63	Page 4-14, Section 4.3.6.1, 2 <sup>nd</sup> paragraph, 3 <sup>rd</sup> sentence	To be consistent with the rest of the BHHRA document, please change the sentence to "...fish ingestion rates for the RME adult based on data from Burger (2002) (37.3 g/day) and Connelly et al. (1992) (31.9 g/day)..."
64	Pages 4-13 to 4-15, Section 4.3.6.1	<p>Reference to the Child Specific Exposure Factors Handbook should be replaced with a reference to the 2011 Exposure Factors Handbook. The 2011 document replaced the Child Specific EFH.</p> <p>The descriptions of the two surveys should consistently use the term "Newark Bay Complex" and not just "Newark Bay".</p> <p>The text regarding the study by Ray et al. (2007b) should also acknowledge the Letters to the Editor written by EPA regarding the limitations of this study and why EPA determined not to evaluate the values derived from this study. Further, the decision regarding inclusion of the Ray et al. study provided in the February 2012 decision resolving the dispute should also be acknowledged here. The text needs to clarify that decisions under Superfund are based on exposures to the RME individual and are not population based.</p>
65	Page 4-15, Section 4.3.6.2, Footnote 26.	This footnote should be deleted. We do not have adequate data on fish populations to make this determination. Further, since human health risk assessments evaluate the individual, not populations, there only needs to be enough fish to support the RME individual's consumption rate.
66	Page 4-16, Section 4.3.6.3	Include further information regarding the reasons for not adjusting the cooking loss value for contaminants. Specifically, the text should indicate the potential for individuals to consume pan drippings in sauces and other preparations.
67	Page 4-18, Section 4.3.6.6	Please remove this section. The information is covered elsewhere in the report.



<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
68	Pages 4-19 to 4-20, Section 4.3.7.3	The skin surface area for the young child will need to be further evaluated based on the updates to EFH 2011 and also the updated Exposure Factors provided in OSWER Directive 9200.1-120.
69	Page 4-21, Section 4.3.7.4	<p>a. As noted previously, reference to the Child Specific Exposure Factors Handbook should be replaced with a reference to the 2011 Exposure Factors Handbook. The 2011 document replaced the Child Specific EFH.</p> <p>b. EPA's Dermal Guidance should also be listed as a reference in this section.</p>
70	Page 4-23, Tables	Please define "na" on the two tables on this page.
71	Page 4-25, Section 4.3.8, 3 <sup>rd</sup> bullet	Revise the sentence from "Child (ages 1 to 6 years,...)" to "Young child (ages 1 to 6 years,...)"
72	Page 4-27, Section 4.3.10.2	The text should clarify the differences between oral absorption factor and relative bioavailability. The text needs to resolve potential overlaps between the equations provided on page 4-6 and the text provided here.
73	Pages 4-28 to 4-29, Section 4.4.1	<p>When the SSP2 data is incorporated into the risk assessment, please use the most current version of ProUCL to update the UCL calculations, both for the sitewide and river segment accessible surface sediments. If any other data sets require recalculation of UCLs, then the most current version of ProUCL should similarly be used.</p> <p>Please note that Version 5.0 is the most current, and the add-on to address dioxin congeners should be used.</p>
74	Page 4-30, Section 4.4.2	<p>In addition to a site wide evaluation (i.e., assuming contact throughout the LPRSA), sediment exposures were evaluated on a refined spatial scale, dividing the river into six three-mile segments. The division of the river into these specific segments is not directly linked to exposure patterns, and other segment divisions could have been selected. The text should note this.</p> <p>In addition, some discussion is warranted in the Uncertainty Evaluation about the degree to which the segment definitions impact risk estimates.</p>
75	Page 4-31, Section 4.4.3	Please provide the sample list used in the RM 6-9 east bank calculation.

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
76	Section 4.4.4.1, Page 4-31	The document references a high 2,3,7,8-TCDD surface water result that was identified as an outlier and removed from the data set considered in the BHHRA. The location and basis for removal of the sample result as potentially representative of surface water quality in the river should be further discussed and evaluated.
77	Pages 4-33 to 4-34, Section 4.4.5.1, First Sentence	<p>The text summarizes total numbers of organisms by species across the 2009-2010 surveys, but the pie charts summarize data from separate surveys. Please add a pie chart that summarizes relative abundance across all surveys.</p> <p>It should be noted in this Section that striped bass is a non-resident species that spends only a part of its time in the LPRSA and, for this reason, striped bass were not sampled for the tissue chemistry program.</p>
78	Pages 4-33 and 4-34, Pie Charts	<p>a. Species in the figure and legend are color coded. However, it is very difficult to match the color for different species. For clarity and easy identification it is suggested that the number of each species caught be also listed on the legend, since the numbers are labeled on the figure. This comment applies to figures on both pages.</p> <p>b. Please remove the blue crab from the pie charts, as these are not pertinent to the relative abundance of fish species and were evaluated separately from fish in the BHHRA.</p>
79	Page 4-34, Section 4.4.5.2	Please add a sentence stating that any species preferences exhibited on this river have a high degree of uncertainty because of the contamination and the existence of a do-not-fish advisory.
80	Page 4-34 and 4-35, Section 4.4.5.3	<p>As noted in the general comments, carp must be included in any mixed-fish diet calculation.</p> <p>Using a mixed fish diet comprised of equal fractions (20%) of each of 5 species evaluated is a reasonable approximation given the inherent uncertainty with the information related to this issue, though other approaches could have been selected (for example, one based on relative abundance). However, a more detailed evaluation of the impacts of this assumption in the uncertainty section is needed.</p>
81	Page 4-35, Section 4.4.5.3	Based on information presented later in the report (e.g., page 7-23, third paragraph), smallmouth bass fillet data were actually combined with largemouth bass fillet data to calculate a largemouth/smallmouth bass EPC in the BHHRA. This information should be clearly presented in Section 4.4.5 (EPCs for Fish Tissue).

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
82	Page 4-35, Section 4.4.5.3, last sentence	Mixed fish diet EPC values should be calculated for a single set of COPCs across species. Risk calculation tables in the BHHRA would be simplified by presenting a single set of EPCs for the mixed diet rather than by repeating COPCs separately for each fish species in that diet.
83	Page 4-35, Section 4.4.6	The RME for crab ingestion based on a combined muscle and hepatopancreas approach is well supported by the knowledge base that is currently available. All discussion of a muscle-only diet should be removed from this section and confined to the uncertainty section.
84	Page 5-2, Section 5.1	The first paragraph of this section can be retained, but the rest should be deleted. Reference can be provided to EPA's Cancer Guidelines and RfD/RfC methodology, as well as IRIS, for further details regarding the approach to developing dose-response relationships.
85	Page 5-3, Section 5.2	The discussion of updates to the IRIS program should reflect the current IRIS process outlined on the webpage <a href="http://www.epa.gov/iris">www.epa.gov/iris</a> . Specifically, this section of the IRIS website should be referenced <a href="http://www.epa.gov/iris/process.htm">http://www.epa.gov/iris/process.htm</a> to explain the process for evaluating chemicals and the discussion of the monthly update should be removed. The Verification Workgroup was disbanded a number of years ago and reference to this group should be removed from the text.
86	Pages 5-2 to 5-5, Section 5.2, and Related Sections	<p>a. The RSL Table is not EPA guidance or guideline or policy and should not be used as the basis for selecting toxicity values.</p> <p>b. The discussion of TCDD needs to acknowledge other toxicity values such as HEAST, the 1986 HAD value for dioxins, and other values provided on the RS Q and A document, Question #44.</p> <p>The 1996 reassessment of PCB toxicity, an externally reviewed document, identified a slope factor of 150,000 mg/kg-day and this value should be used in the calculation of risks for both dioxin-like PCBs and TCDD TEQs. The value of 150,000 mg/kg-day is listed on page 63 of the 1996 reassessment of PCB cancer toxicity. The text should also refer the reader to the Uncertainty Discussion regarding the range of toxicity values for dioxin.</p> <p>Please note that EPA is aware that draft versions of Tables 5-1 and 5-2 were sent to us for review on 2/7/2014. These tables were discussed during the 3/6/2014 EPA-PA-CPG Technical Coordination Meeting. During that meeting, EPA recommended the use of 150,000 mg/kg-day for the slope factor rather than 130,000 mg/kg-day, as captured in the meeting minutes sent to the CPG via email on 3/26/2014.</p> <p>c. Update the toxicity values to indicate that recommendations for surrogates provided by Superfund Technical Support Center provided</p>

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		<p>by EPA (attached). Accordingly, the last paragraph of this section can be deleted.</p> <p>d. The discussion of Uncertainty Factors should indicate the values range from 1 to 10 especially and reference the December 2002 report titled: A Review of the Reference Dose and Reference Concentration Processes (available at <a href="http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf">http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf</a>). For example, this document indicates: If there are no appropriate human data, an interspecies UF of 1, 3, or 10 is used. The text should be modified to indicate the range of UFs from 1 to 10. This document also indicates the limitation of using UF at the maximum level of 10,000 and does not support the use of UF greater than 3,000 in the decision making process. The text requires revisions to address these topics.</p>
87	Pages 5-4 to 5-5, Section 5.2	<p>Attached are responses from the Superfund Technical Support Center regarding the surrogate values that should be used to update the RfDs and CFSs, where appropriate. In addition, the last paragraph of this section can be removed. Findings from the STSC include the following recommendations:</p> <p>a. Overall, weight of evidence analysis identifies 4,4'-DDT as an appropriate surrogate for 4,4'-DDD and 4,4'-DDE based on similarities in structure, metabolism and toxicity profile.</p> <p>b. Altogether, the analysis is unable to suggest any viable surrogates for 2,4'-DDT, 2,4'-DDD and 2,4'-DDE due to limitations in the toxicity database.</p> <p>i. Surrogate analysis for 2,4'-DDT cancer risk values: Considering the lack of conclusive information, comparative analysis of the carcinogenicity and genotoxicity of 2,4'-DDT and structural analogs is not currently possible, preventing the identification of cancer surrogates.</p> <p>ii. Surrogate analysis for 2,4 -DDD cancer risk values: Overall, chronic systemic studies suggest that 2,4'-DDD may be tumorigenic to mice and rats. Weight of evidence analysis indicates that 4,4'-DDD could be a potential cancer surrogate for 2,4'-DDD based on structure similarities and overlapping tumor types in mice (lung) and rats (endocrine glands). However, the limited information on the carcinogenicity of 2,4'-DDD in the liver currently available is inadequate to support 4,4'-DDD as a viable cancer surrogate.</p>

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
		<p>iii. Surrogate analysis for 2,4'-DDE cancer risk values: Therefore, supporting evidence on the carcinogenicity of 2,4'-DDE is deficient and inadequate to draw any comparisons to the candidate analogs, precluding the identification of appropriate cancer surrogates.</p> <p>c. Paper evaluating the feasibility of <i>cis</i>-chlordane (CASRN: 5103-71-9) as a potential surrogate for noncancer and cancer effects of compounds <i>cis</i>- (CASRN: 5103-73-1) and <i>trans</i>-nonachlor (CASRN: 39765-80-5), and oxychlordane (CASRN: 27304-13-8). Only chlordane was considered for further analysis as a potential surrogate for both noncancer and cancer effects:</p> <p>Overall, chlordane is an appropriate surrogate for both non-cancer and cancer effects of <i>cis</i>- and <i>trans</i>-nonachlor, and oxychlordane chemicals, but the variation in the relative potency of toxicity of these test chemicals from chlordane should be carefully accounted when deriving surrogate risk values and slope factors based on the IRIS document for chlordane (technical; CASRN: 12789-03-6) (U.S. EPA, 1997).</p> <p>d. Paper evaluating the feasibility of naphthalene (CASRN 91-20-3) as a potential surrogate chemical for the oral noncancer and cancer risk assessments of C2-, C3-, and C4-naphthalenes, and, evaluating the feasibility of chrysene (CASRN 218-01-9) as a surrogate chemical for oral noncancer and cancer risk assessment of C2-benzanthracene/chrysene:</p> <p>i. Taken together, naphthalene is not the best surrogate for both oral non-cancer and cancer assessments of C2-, C3-, and C4-naphthalenes as suggested by the requestor. However as described above, 2-methylnaphthalene could be a good surrogate for the non-cancer assessment of C2-, C3-, and C4-naphthalenes. Therefore, fluoranthene is the best possible surrogate (and not chrysene as suggested by the requestor) for the oral non-cancer assessment of C2-benzanthracenes</p> <p>ii. Chrysene is suggested as a possible surrogate for the cancer assessment of C2-benzanthracenes by the requestor and the STSC agrees with this suggestion.</p>
88	Page 5-5, Section 5.3	Include a reference to EPA's BMD guidance 2012 available on the EPA Risk Assessment Forum webpage.

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
89	Pages 5-6 to 5-7, Section 5.3	<p>a. Modify the section regarding the uncertainty factor of 10,000 to indicate these values are developed in the Provisional Peer Review Toxicity Values (PPRTVs) as screening levels and are not designed to be used in the decision making process as outlined in the document "A Review of the Reference Dose and Reference Concentration Processes" available at: <a href="http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf">http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf</a>.</p> <p>b. Change the UFs to a range of 1 to 10 since 10 is not always used as the UF depending on the available data. Values used in IRIS have included 1, 3.14, and 10.</p> <p>c. Consistent with the recommendations for thallium the text should indicate that the Appendix value will be used for screening purposes only.</p> <p>d. The discussion of the RfD used for TPH C9-C18 should reference the information provided in the PPRTV document which clearly states that this value should be used for screening purposes only and not to support a risk management decision. Information from Indiana should be removed from the paragraph and replaced with the following information from the PPRTV document:</p> <p>"Users of screening toxicity values in an appendix to a PPRTV assessment should understand that there is considerably more uncertainty associated with the derivation of a supplemental screening toxicity value than for a value presented in the body of the assessment." In addition, the text should indicate that despite this evaluation, the concentrations remained below the screening levels. The text needs to be edited to refer the reader to the PPRTV Chemical File.</p>
90	Pages 5-7 to 5-10, Section 5.4	<p>a. Page 5-8: The last paragraph should state that those chemicals evaluated following the 2005 Cancer Guidelines include the new classification process outlined in the 2005 Cancer Guidelines. Other chemicals on IRIS that have not been updated still maintain the old classification system and will be updated as appropriate during the IRIS chemical reassessment. Therefore, both classification systems are provided in the appropriate Tables consistent with the information available at IRIS.</p> <p>b. Page 5-9: The discussion of chemicals with a Mutagenic Mode of Action (MMAOA) should clarify whether any other chemicals listed on the Superfund Webpage <a href="http://www.epa.gov/oswer/riskassessment/sghandbook/chemicals.htm">http://www.epa.gov/oswer/riskassessment/sghandbook/chemicals.htm</a> were evaluated. The text should clearly explain whether Chromium +6 was evaluated including an assessment of a MMAOA. The text</p>

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		<p>regarding the IRIS review of Chromium should be shortened to indicate EPA is re-evaluating this chemical through the IRIS process.</p> <p>c. Page 5-10: The calculation of ADAFs should be based on the individual years and not the adjusted ADAFs provided at the bottom of the Table on page 5-10.</p>
91	Page 5-10, Section 5.5	Section 5.5 should be retitled as "Dermal Absorption Factor". The text should also identify the specific chemicals where oral absorption factors were applied.
92	Page 5-12, Section 5.6.1	<p>The text here states that the CalEPA (2013) CSF of 1.3E+05 (mg/kg-day)-1 for 2,3,7,8-TCDD was selected "in accordance with USEPA's hierarchy (USEPA 2003a)." However, the hierarchy referenced gives equal weight to several other potential sources of toxicity information within "Tier 3." Therefore, citing this hierarchy is not an adequate basis for selecting the CalEPA CSF and additional information will need to be provided consistent with the RSL Questions and Answers #44.</p> <p>As explained previously, the HEAST value of 1.50E+05 should be used to provide consistency with the 1996 Reassessment of Cancer Toxicity for PCBs, including for dioxin-like PCBs and for TCDD TEQ (see Example 3).</p>
93	Pages 5-13 to 5-14	Please see general comments regarding PCB classification for carcinogenicity.
94	Page 5-14, Section 5.6.2.2	This footnote will need to be revised to indicate there is significant uncertainty based on the limited information regarding the composition of Aroclor 1254 used in the development of the oral Cancer Slope Factor, as discussed in the paper by V. J. Cogliano noted above.
95	Page 5-15, Section 5.6.2.3	Please clarify in the text that the oral RfD for Aroclor 1254 is being used for all PCBs and for all media.
96	Page 5-16, Section 5.6.3	The text should discuss how the oral RfD for naphthalene was selected for alkylated naphthalenes. See comments from Superfund Technical Support Center provided above.
97	Page 5-16, Section 5.6.4	<p>a. The discussion regarding organic and inorganic arsenic requires further clarification.</p> <p>b. The text should clarify organic arsenic is not being evaluated quantitatively.</p>

<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
98	Page 5-17, Section 5.6.5	<p>As discussed under Appendix G, further detail regarding the lead assessment is needed. Information needed includes clarification regarding the model used for the adolescent and the basis, CDC's changes to the recommendations for blood lead levels that are being considered by EPA, and discussions regarding the exposure assumptions used in the lead models.</p> <p>Please note in the uncertainty section that the CDC has reduced their recommended acceptable blood level from 10 ug/dl to 5 ug/dl. EPA is currently evaluating the updated CDC value.</p>
99	Page 6-1, Footnote 38	Current EPA guidance that updates standard default exposure factors for Superfund (OSWER Directive 9200.1-120, February 2014) recommends continuing use of 70 years as the default "lifetime" duration, pending additional input from EPA's National Center for Environmental Assessment (NCEA). Therefore, this footnote should be deleted.
100	Page 6-3, Section 6.2, 4 <sup>th</sup> Paragraph	<p>The second sentence states "The tables summarizing the HI show both the total HI and HI by target endpoint." However, the tables in Sections 6.3.1 through 6.3.5 only indicate whether an HI is greater than or less than 1. These tables should show the actual total HI and HI by target endpoint. Similarly, these tables should show the actual estimated excess lifetime cancer risks (ELCRs). While tables eventually referenced in Section 6.3.6 do show total HIs and total cancer risks, they still do not summarize "HI by target endpoint."</p> <p>This overall approach was noted in the general comments and should be addressed throughout the report.</p>
101	Page 6-4, Section 6.3.1, 1 <sup>st</sup> Paragraph	Remove the last sentence. The evaluation of potential risks from the crab consumption pathway is a reasonable maximum exposure; it is not associated "with a high degree of uncertainty."
102	Pages 6-4 to 6-24, Section 6.3	<p>Section 6.3, entitled "Risk Characterization Results," includes minimal discussion of the risk characterization results and instead relies on tables which do not transparently present the calculated risk. Receptor-specific subsections should provide and discuss numerical risk estimates for those receptors. Chemicals and exposure pathways contributing the most to risks should be discussed.</p> <p>Receptor-specific subsections should point the reader to the relevant Section 6 summary table(s) for the given receptor, and not just to Appendix I. Tables 6-1 through 6-14 should not simply be mentioned in a single sentence on page 6-22, with no context or discussion. As stated on page 8-26 of EPA's Risk Assessment Guidance for Superfund (Part A) (1989), "These tables must be accompanied by explanatory text, as described in the</p>



<u>No.</u>	<u>Page No.</u>	<u>Specific Technical Comments</u>
		<p>previous section, and should not be allowed to stand alone as the entire risk characterization.”</p> <p>The risk characterization summary (Section 6.3.6) should provide some discussion of:</p> <ul style="list-style-type: none"> <li>• exposure pathways/media that did not exceed risk thresholds (e.g., even with the conservative exposure assumptions for swimming, estimated risks from surface water contact did not exceed the NCP risk range of <math>10^{-4}</math> for cancer risk or HI of 1);</li> <li>• context for exposure pathways/media that did exceed risk thresholds (e.g., risks from exposure to sediment were exactly the same for swimmers, waders, and anglers for a given age group because the same exposure assumptions were used for all receptors); and</li> <li>• relative risks among receptors (e.g., that potential risks to anglers may be orders of magnitude higher than risks to other receptors).</li> </ul>
103	Page 6-9, Section 6.3.1.4, Table	<p>Footnote (a) is confusing as written. Please revise to “Cancer risks represent exposures for a child and adult over a 30 year period, while non-cancer hazards provided in the previous subsections are calculated for specific age ranges and not combined.”</p> <p>This also applies to other tables in Section 6.3.</p>
104	Page 6-11, Section 6.3.2.2, Table	<p>The potential risk under RME scenario for RM6-9 should be “within the NCP risk range” based on RAGS D Table 9.33.</p>
105	Page 6-12, Section 6.3.2.2, Table	<p>The total RME cumulative risk should be <math>\leq 10^{-4}</math>**. In the footnote, please add the following footnote for **: “Cumulative risks for RM 6-9 and RM 6-9 east bank only. The cumulative risks for the remaining RMs and site wide are within the NCP risk range for the adolescent swimmer.”</p>
106	Page 6-18, Section 6.3.3.4, Table	<p>In the footnote, please revise the text to “...The cumulative risks for the remaining RM and for site wide are within the NCP risk range.”</p>
107	Pages 6-23 to 6-24, Table	<p>This table should include the total cumulative risks for RME and CTE scenarios.</p>

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108	Pages 6-25 to 6-27, Section 6.4	<p>Section 6.4, entitled “COC Identification,” limits discussion of specific COCs to a couple of examples with pesticides and PAHs in one paragraph (bottom of page 6-26). The text does not discuss dioxins/furans or PCBs – chemicals contributing the most to risk estimates for this site, nor the relative contribution to risk of all the COCs identified.</p> <p>This section will need to be rewritten to discuss the chemicals that are driving the risks at the site and to discuss the relative contribution of COCs to total risk estimates.</p>
109	Page 6-26. Paragraph 1.	<p>This page has a discussion regarding the further refinement of COCs in the FS based on a number of risk assessment considerations i.e., background, robustness of the chemical toxicity assumptions, estimates of exposure point concentrations, the reliability of the exposure assumptions, and issues associated with sampling and analysis and the CTE analysis. The risk assessment is the appropriate venue for this discussion and re-evaluation of the risk assessment in the FS is not appropriate. Further, the CTE provides an additional source of information but the decision is based on the RME assessment. This further evaluation is not necessary.</p>
110	Page 6-28, Section 6.5 1 <sup>st</sup> Paragraph, 2 <sup>nd</sup> Sentence	<p>The EPA guidance cited here (USEPA 2002c) does not actually call for calculating background risks. Rather, the guidance recommends a comparison of site and background concentrations, and a discussion of how elevated background concentrations contribute to site risks. However, RAGS Part A (USEPA 1989) (p. 5-18) does state that “if background risk might be a concern, it should be calculated separately from site-related risk,” and could be cited here to support presentation of background risk estimates.</p>
111	Page 6-28, Section 6.5.1	<p>This section will need to be updated in the revised draft of the document. In general, more explanation about the choice of background locations should be included in this section. In addition, Appendix L requires a more in-depth discussion of the logic process used in making these decisions (see comments on Appendix L for more detail).</p>
112	Pages 6-28 to 6-35, Section 6.5.2	<p>Background risks must be calculated in a manner consistent with risk assessment guidance, using the 95 percent UCL on the arithmetic mean and not a simple arithmetic mean. Specifically:</p> <p>Sections 6.5.2 misrepresents the UCL concentrations used in the risk calculations as “upper-bound” values. The concentration values used (i.e., 95 percent upper confidence limit of the arithmetic mean) are estimates of the arithmetic average concentration of each contaminant at the site accounting for uncertainties in the data, as accurately described in Section 4.</p> <p>From EPA’s Supplemental Guidance to RAGS: Calculating the Concentration Term (1992), “Because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this variable. The 95</p>

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		<p>percent UCL provides reasonable confidence that the true site average will not be underestimated.”</p> <p>A simple arithmetic mean from the site data does not account for uncertainties in that data. Such uncertainties can be pronounced if the number of samples is limited and/or there is a lot of variability in the data. If you took multiple sets of the same number of samples from the site, the arithmetic mean would differ each time. The 95 percent UCL is a more robust statistic for estimating the true mean.</p> <p>Discussions of the UCL concentration statistic in Section 6.5.2 and Appendix L should be corrected, the “mean” scenario should be removed, and the “upper-bound” scenario should be correctly labeled as the RME scenario.</p> <p>Tables in these sections will need to be updated as well.</p>
113	Pages 6-28 to 6-35, Section 6.5.2	This section should be revised as per General Comment 13.
114	Page 6-35, Section 6.5.3	This section should be removed. It is not appropriate for an EPA human health risk assessment.
115	Chapter 7, General	<p>The uncertainty section is very long and inclusive of potentially valid but secondary information on the shortcomings of risk assessment methodology. A meaningful uncertainty section should be a balanced appraisal of major uncertainties that will significantly affect the site specific numerical risks. The entire chapter needs to be refined to focus on those key uncertainties that could affect the calculated risk.</p> <p>As noted in the general comments, statements contesting standard risk assessment methodologies, procedures and values should not be included here. Further, the chapter should address both over and underestimates of risk; not all uncertainties lead to an overestimate of risk. It is also not appropriate to indicate how the uncertainty information will be used in the risk management process. The goal of the risk assessment is to support the risk management decision, but not to make the decision.</p> <p>The section states several times that risk would be less if “more realistic” assumptions were used. This language is unsupported. The uncertainty section can look at the effects of using different assumptions, but these are not necessarily more realistic. Please remove this language from the document.</p> <p>Some specific concerns are highlighted below.</p>

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116	Page 7-1, Introduction, 2 <sup>nd</sup> Paragraph	Consistent with the general comment on this chapter, please delete the 3 <sup>rd</sup> and 5 <sup>th</sup> sentences from this paragraph, and revise the remaining language, as appropriate.
117	Pages 7-1 to 7-3, Section 7.1.1	<p>Consistent with RAGS Part D, a summary of the data evaluation and its utility in the risk assessment should be developed. The planning worksheets on data usability are available at:  <a href="http://www.epa.gov/swerrims/riskassessment/ragsd/planning.htm">http://www.epa.gov/swerrims/riskassessment/ragsd/planning.htm</a>.</p> <p>The section does not give an overall completeness summary for tissue data. A summary statement of usable results for tissue samples, similar to that for surface water and sediment, should be added to this section.</p>
118	Pages 7-3 to 7-6, Section 7.1.2	<p>The discussion of chemical selection should also indicate the potential underestimates of risks for chemicals lacking toxicity information.</p> <p>This section should contain some discussion of the COPC selection process for fish tissue. Following our direction to group COPCs across species, this would be a good place to discuss the uncertainties associated with any COPCs that might differ between species.</p>
119	Pages 7-4 to 7-5, Section 7.1.2.1, Summary	The text should state that the chemicals not detected with detection limits above RSLs can result in an underestimate of risk/hazards. More discussion of this issue in the text.
120	Page 7-6, Section 7.1.2.2	The first full sentence at top of the page should give the reference and explain the basis for stating that the New Jersey criterion for cyanide “may be a more relevant metric.” This is of importance since it is not clear that this determination is based on risk.
121	Page 7-6, Section 7.1.3	This section should be removed from the uncertainty section. A detailed discussion of background was included in the Risk Characterization chapter, consistent with guidance.
122	Pages 7-6 to 7-7, Section 7.2.1	<p>The language describing the RME individual should be revised to include a description of the RME individual and how it is evaluated. As described in the Standard Default Exposure Assumption guidance, the goal of RME is to combine upper-bound and mid-range exposure factors in the exposure equation so that the result represents an exposure scenario that is both protective and reasonable, not the worst possible case since it includes a mix of high end and average exposures. The current text suggests this is a “worst case” scenario and requires revision.</p> <p>The discussion at the top of page 7-7 requires further clarification based on the combination of average and high end exposure assumptions that are</p>

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		<p>used in the evaluation of the RME individual. The text also needs to clarify that the decision is based on the RME individual and not the CTE individual.</p> <p>The text should also state that many of the values are standard default exposure factors that are used at Superfund sites across the country.</p>
123	Pages 7-7, Section 7.2.1	A sentence should be added to the last paragraph of this section stating that the exposure factors were updated to reflect the Superfund Standard Default Exposure Factors published in 2014. As was noted previously, the entire risk assessment should be updated using the new EPA guidance values, except for exposure duration.
124	Page 7-8, Section 7.2.1.2, Introduction	<p>Along with those factors mentioned in 3<sup>rd</sup> sentence of this paragraph, the text should also state urban populations often have less opportunity to travel to more desirable locations for recreation.</p> <p>This change should also be addressed on Page 7-10, Section 7.2.1.3.</p>
125	Page 7-8, Section 7.2.1.2, Sediment Ingestion Rates	<p>The text should acknowledge that these issues were considered in the externally peer-reviewed updated 2011 Exposure Factors Handbook, but this update still recommends use of the same values that were recommended previously.</p> <p>In the last sentence of this section, the word “likely” should be changed to “may.” The text does not address the characteristics of sediment that may result in material spending more time on the skin and being more available for ingestion.</p> <p>The units in this section should be mg/day and not g/day.</p>
126	Page 7-9, Section 7.2.1.2, Surface Water Exposure Assumptions	<p>While the urban setting is a given, the other reasons listed here for limited swimming may be present currently, but could change in the foreseeable future as towns along the river improve their waterfronts. The conclusion here may be appropriate for current exposures but not for future exposures. Suggest ending the paragraph with:</p> <p>“...lead to overestimates of current exposure to LPRSA sediment and surface water via swimming. They do, however, provide a conservative estimate of risk from swimming exposures for areas with fewer visible deterrents and more access points.”</p> <p>It should be noted that even with the conservative exposure assumptions for swimming, estimated risks from surface water contact did not exceed risk targets. It should also be noted that risks to swimmers from exposure to sediment equal those to waders (the same exposure assumptions were used for both receptors).</p>

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127	Section 7.2.1.3, Pages 7-10 to 7-13, Fish and Crab Consumption Exposures	<p>a. EPA provided details regarding the selection of the fish consumption surveys for the Lower Passaic River. The text needs to clarify that the Burger survey was for the Newark Bay Complex and not Newark Bay alone. The text also needs to acknowledge that EPA has determined it cannot rely on the results and conclusions of the TSI creel-angler survey, as noted in letters to the editor submitted by EPA and NJDEP.</p> <p>b. The text needs to provide a more even presentation of information, consistent with the results of the Dispute Resolution. Key points to emphasize include: the Ingestion Rates (IRs) developed for use for the LPRSA are comparable to those developed for other sites within Region 2; the Burger and Connolly studies were reviewed through institutional review boards, which is not the case with the other surveys mentioned; and based on the differences in populations the risks may be underestimated.</p> <p>c. The text provides information on the CPG survey, which was not overseen by EPA. Lacking complete information (e.g., metadata), EPA has not been able to evaluate or understand the method by which the CPG converted the results of the CAS to a fish consumption rate. Therefore, reliance on the results of this survey is premature.</p> <p>d. The text regarding the U. S. Department of Agriculture (USDA) Continuing Survey of Food Intakes by Individuals is not an appropriate comparison since it represents a national market-basket survey.</p> <p>e. On Page 7-13, the text refers to alternate fish ingestion rates. The ingestion rate of 17.5 grams/day was derived for water quality protective criteria to protect the general public, including both consumers and non-consumers. For purposes of this risk assessment we are focused on exposures to consumers only and therefore this is not a valid comparison. The fish ingestion rate of 7.5 mentioned in relation to the Lower Duwamish Waterway is based on the consumption of pelagic fish. The study includes a number of other ingestion rates for species where the total fish ingestion rate is higher, including an IR of 97.5 gram/day for members of the Tualip Tribe.</p> <p>Discussion of both these ingestion rates should be removed from the document since they do not represent an RME individual.</p>
128	Section 7.2.1.3, Page 7-13	There is a typo in the footnotes; there are two "b"s and no "c".

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129	Page 7-14, Section 7.2.1.3, Fraction Ingested for Fish	<p>a. The title for this section should be changed to "Fraction from Source for Fish Ingestion".</p> <p>b. Please add the following text after the first sentence: "Given the 17-mile extent of the LPRSA and the variety of fish species it can support, a sizeable recreational angler population is considered likely to catch a substantial fraction of their fish from the LPRSA. In addition, it is expected that a portion of the population do not have the means to easily travel far from the LPRSA. However...."</p> <p>c. The third sentence in this section should start "The consumers of LPRSA fish who do travel out of the area...."</p> <p>d. Please change the final sentence to read "...likely overestimates risk from fish consumption for those of the LPRSA anglers who catch and consume fish from outside the LPRSA."</p>
130	Page 7-14, Section 7.2.1.3, Fraction Ingested for Crab	The title for this section should be changed to "Fraction from Source for Crab Ingestion." Please remove the text and table starting with "An example of the effect of changing FI..." The new final sentence should read "Based on the available information, it is likely that the assumption that 100% of the crab consumed comes from the LPRSA may overestimate risk for anglers who catch and consume crabs from outside the LPRSA."
131	Page 7-15, Section 7.2.1.3 Cooking Loss	The first paragraph of this section on this page states that it is "unrealistic" to assume that there is never any cooking loss. The language should be revised to state that it is "very conservative" to make this assumption. Further, the second to last sentence of this paragraph "more average values" are used in the CTE scenario, not more realistic.
132	Page 7-17, Section 7.2.1.3, Cooking Loss	Second sentence of the first full paragraph on this page: add the phrase "for the CTE scenario" to the end of this sentence.
133	Page 7-17, 7.2.1.3, Angler Body Weight and Exposure Duration	This section should be removed.
134	Pages 7-17 to 7-18, Section 7.2.1.4	The introductory text requires editing to highlight the most important points regarding the fish/crab consumption. The current text includes a lot of speculation regarding the amounts of fish consumed, non-resident fish species and consumption of both fish and crabs. It is recommended that the text highlight the most important aspects of the analysis i.e., risks are above the risk range; even considering consumption of individual fish species the analysis results in cancer risks exceeding the NCP risk range and non-cancer health hazards that exceed the goal of protection of an HQ = 1.

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		While discussing the uncertainty of estimating a mixed fish diet, the point should also be made that whatever mixed diet of LPRSA fish is consumed, the NCP risk range and the non-cancer health hazard goal of protection will be exceeded for the RME scenario. For the CTE scenario, cancer risks will be within or exceed the NCP risk range and the goal of protection for non-cancer health hazards will be exceeded for any mixed fish diet.
135	Page 7-18, Section 7.2.1.4	Footnote 46 should either be removed or revised, as per Comment 42.
136	Page 7-18, Section 7.2.1.4, Fish Tissue Type Consumed	The last sentence of this section should be revised to state that fish consumption risks “may be several times higher than the fillet-based risks....” Even if the risk is doubled, that is significant.
137	Page 7-19. Section 7.2.1.5. Consumption of Other Biota	Please remove the second paragraph of this section. Instead, state that there is anecdotal evidence that turtles are being occasionally caught and potentially consumed, but it is unlikely that site risks have been underestimated by not quantitatively evaluating consumption of LPRSA biota other than fish and crab since the frequency of consumption of turtles is likely less than for fish and crab.
138	Page 7-19. Section 7.2.2. Estimate of Exposure Point Concentrations	The last three sentences of the paragraph from Pages 7-19 to 7-20 should be deleted. The statements are inaccurate and contradict language included earlier in the same paragraph. Note that we agree that the dataset is robust, but that does not mean that a simple arithmetic average should be used in place of the 95% UCL identified in EPA’s guidance.
139	Page 7-20, Section 7.2.2	<p>A sensitivity analysis was performed to compare UCLs calculated using both ProUCL versions for several COPCs and media. While differences were often minimal, there was one instance (benzo[a]pyrene in blue crab) where the UCL calculated using Version 5.0.00 was 80% greater than the UCL calculated using Version 4.1.01. In light of this example, the conclusion that “the use of Version 4.1.01 UCLs in this BHHRA does not significantly over or underestimate potential risks” is not adequately supported. What feature of the benzo(a)pyrene data set caused the UCLs to differ so significantly? What other data sets evaluated using Version 4.1.01 have that feature and may have therefore been underestimated by up to 80%?</p> <p>The text should also describe how the non-detects were addressed in the calculations and the potential uncertainty in this approach.</p>



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140	Page 7-20 to 7-22, Section 7.2.2.1 Uncertainty in Surface Water EPCs.	The language in this section will need to be updated to reflect inclusion of all of the previously unvalidated surface water data in the next version of the document. When doing so, please keep in mind that it is important to place the information about uncertainty in context. Specifically, the site-wide cancer risks and hazards due to exposures to surface water were within the NCP risk range and below the goal of protection of an HI = 1. .
141	Page 7-22. Section 7.2.2.2, Uncertainty in Sediment EPCs.	The evaluation needs to be expanded to include the additional data collected in 2013. This section will need to further expand the discussion regarding the overall impacts of this evaluation on the calculated cancer risks and non-cancer health hazards.
142	Page 7-25, Section 7.2.2.5, Assumption of No Degradation	It is not appropriate to discuss this topic in the BHHRA. The concerns raised here will be addressed in much greater detail elsewhere as part of the RI/FS process. Please remove this section.
143	Pages 7-27 to 7-28, Section 7.2.3.1	<p>For TCDD-TEQ, this section notes that the dermal absorption fraction (DAF) decreases when the fraction organic carbon (foc) content of the sediment increases. We continue to support use of a DAF 0.03 for TCDD-TEQ, for the following reasons:</p> <ul style="list-style-type: none"> <li>a. The average foc of sediment contacted over time (either the arithmetic mean or, better yet, the 95% UCL of the arithmetic mean) should be used to determine the appropriate DAF. This section notes that the average foc is 4.6%, which would support use of a DAF of 0.03 for TCDD-TEQ.</li> <li>b. The samples listed in this section do not appear to be on Figure 3-1 of the report that shows accessible sediment sample locations. These foc data were in fact collected from deeper parts of the river, and areas outside the “accessible sediment” zone evaluated in the BHHRA. As such they are not relevant to exposures estimated in this report. The average foc should be calculated from data collected within the exposure area.</li> </ul>
144	Page 7-28, Section 7.2.3.1	<p>EPA evaluated the Mayes study as part of the Housatonic Risk Assessment. The following summarizes EPA’s concerns regarding this study:</p> <p>EPA’s Superfund Dermal Workgroup (EPA, 2001) reviewed the data submitted by Mayes in the HHRA and concludes that two protocol design features preclude the use of this study as the basis for a dermal absorption factor to be used in the Housatonic HHRA (Vol. I, p. 2-21; Vol. IIIA, p. 4-26). The first feature was that the monkeys were not restrained during the exposure period, as they were in the Wester et al. (1993) study, prompting concern that the lack of restraint could result in loss of soil contact with the skin at the test</p>

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		<p>area and thus lead to a lower than expected applied dose. The second feature was that the study did not control for “monolayer” conditions. This concern is based on the theory that dermal absorption of PCBs comes only from the soil monolayer in immediate direct contact with the skin, and that by using a smaller particle size and the same application rate used by Wester et al. (1993), there was a five-fold excess of soil over that monolayer. According to EPA, correction for that “overloading” would result in an estimated dermal absorption rate of 20 percent for the monolayer, which is higher than EPA’s 14 percent recommendation.</p> <p>Either remove the text regarding this study from the report or revise the text to incorporate the above information, as appropriate.</p>
145	Page 7-29, Section 7.2.3.1	<p>It is recommended that the discussion regarding PAHs be removed from this discussion since dermal exposures to PAHs are not a significant risk driver. Moreover, the studies cited in the text were published prior to the issuance of USEPA 2004b (RAGS Part E) and, therefore, were presumably reviewed and considered in the preparation of this peer reviewed guidance.</p>
146	Pages 7-29 to 7-31 Section 7.2.3.2	<p>The only chemical with an assigned oral bioavailability value is arsenic. The EPA Technical Review Workgroup for Metals and Asbestos Bioavailability Committee has not approved the use of other bioavailability values for other chemicals. EPA disagrees with providing new bioavailability values that have not been reviewed or adopted by the Workgroup Committee.</p> <p>It is recommended that the text simply indicate the potential for reduced bioavailability that cannot be quantified for the various chemicals identified as COPCs for the LPRSA. The table on Page 7-31 should be removed since these values have not been reviewed or adopted by EPA or submitted to the Bioavailability Committee for review.</p>
147	Page 7-31, Section 7.3	<p>In the introduction to this section, the text should provide references to EPA’s guidelines and guidance for the development of toxicity values.</p>
148	Page 7-31 to 7-32, Section 7.3.1	<p>The text should note that the 2004 RfD/RfC guidance recommends not using values with uncertainty factors greater than 3,000 in the decision making process. The current text describes the use of an appendix value which is not intended for use beyond screening due to the levels of uncertainty i.e., Cancer Guidelines and 2004 RfD/RfC guidance..</p>
149	Pages 7-32 – 7-33, Section 7.3.2.1	<p>a. The text should mention EPA’s process of public review and comment, external peer-review and response to comments in developing CSFs.</p>

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		<p>b. For dioxin, the text should discuss the use of RSLs and that they are screening values. The value selected for use in this risk assessment is one of a range of values. The text should refer to Section 7.3.6.1, where this issue is discussed in more detail.</p> <p>c. The statements regarding PCBs carcinogenicity data requires further clarification. As described previously, the IRIS files indicate there is suggestive evidence of carcinogenicity and IARC recently classified PCBs as a known human carcinogen. The text should indicate EPA has classified PCBs as a probable human carcinogen based on animal data and suggestive evidence in humans.</p>
150	Page 7-33, Section 7.3.2.2	<p>The last sentence of this section states that few changes have been made to existing CSFs. However, PCBs were updated in 1996 (USEPA 1996) and included a bodyweight to the <math>\frac{3}{4}</math> power extrapolation. This should be noted in the text. Also, in addition to the reference to USEPA 1992d, the 2005 cancer guidelines should be referenced as this approach is described on Page 1-13.</p>
151	Pages 7-33 to 7-35, Section 7.3.2.3	<p>The text provides information from a number of other federal agencies and international agencies describing the dioxin toxicity values and their significance. The re-evaluation of dioxin by EPA's Office of Research and Development and the IRIS Program should be mentioned in the text.</p> <p>Here, and throughout the document, there is considerable discussion regarding the on-going dioxin reassessment. The following information should be added to this section to provide a more balanced discussion: highlight EPA's guidance, and the development of CSFs and their uncertainty; acknowledge that EPA has a process for developing CSFs consistent with this guidance, and that further details for individual chemicals are provided in the IRIS chemical files, PPRTVs and other documents supporting the development of toxicity values used in this assessment; and note that the cancer risks may be under- or overestimated depending upon the database of information available for each individual chemical.</p> <p>In addition, the 2<sup>nd</sup> full paragraph on Page 7-34 should be deleted ("There is also support..."). This information is still under review by EPA and, as the text notes, is not currently recognized by EPA as a potential effect. A BHHRA is not the place to discuss these issues.</p>
152	Pages 7-35 to 7-38, Section 7.3.3	<p>The bulleted list from Pages 7-35 to 7-36 should be deleted. This information is provided in USEPA 2010d, which is referenced. In fact, much of the information in this section comes directly USEPA 2010d and does not need to be recounted here. Please shorten and revise the section to concentrate</p>

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		<p>on the relative percentage of risk from 2,3,7,8-TCDD, TCDD TEQ and PCB TEQ.</p> <p>As per General Comment 15, information regarding dioxin-like versus non-dioxin like PCBs can be added, including whether enhancement of dioxin-like PCBs was identified.</p>
153	Pages 7-39 to 7-40, Sections 7.3.5 and 7.3.6	<p>EPA has recently finalized several surrogate values. These values are provided in the documentation attached to these comments.</p> <p>As indicated previously, values with uncertainty factors greater than 3,000 should be used for screening purposes only. In addition, appendix values from PPRTVs should only be used for screening as well.</p>
154	Pages 7-40 to 7-44, Section 7.3.6.1	<p>Please see Comment No. 86 and revise this section accordingly. In addition:</p> <p>It remains unclear why information on state application and use of the values listed in #44 are provided in this risk assessment. The bullets should be deleted. Further, this text presents information on state soil values, while the main decision is based on fish/crab consumption and the discussion of cleanup values is outside the goals of the BHHRA.</p> <p>The text regarding HEAST should acknowledge that the HEAST values were developed specifically for the Superfund Program. The statement regarding the review by other program offices is not appropriate. Further the text should indicate this value was included in the 1996 Reassessment of PCB Cancer Toxicity.</p> <p>The discussion of EPA's 2010 value should be removed since this document is a draft "Do Not Cite or Quote Value" for external peer review and has not yet been finalized and therefore should not be used in this assessment.</p> <p>The section should note that each of the toxicity values discussed yields risks above the NCP risk range and a non-cancer goal of protection of an HI = 1.</p>
155	Pages 7-45 to 7-46, Section 7.4.2	<p>The statement that most of the assumptions about exposure and toxicity are upper-bounds or maxima is flawed. The assumptions used in the risk assessment are in fact a mix of average and high-end estimates.</p> <p>First, this section incorrectly represents the chemical concentrations used in this report as 95th percentiles. EPA guidance specifically cautions against confusing these terms. EPA's Supplemental Guidance to RAGS: Calculating the Concentration Term (1992) states, "Although the 95 percent UCL of the mean provides a conservative estimate of the average (or mean) concentration, it should not be confused with a 95th percentile of site concentration data (as shown in Highlight 2)." The figure in Highlight 2 of this guidance that is mentioned clearly illustrates the concept.</p>

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		<p>Second, the section does not acknowledge the several parameters that are from the mid-range of their distributions. In addition to the chemical concentrations, average or median values are used for skin surface area, sediment ingestion rate, adherence factors, body weight, and lifetime. The statistical example presented in the second paragraph assumes use of a soil ingestion rate that exceeds 95 percent of the population. The 95th percentile value of soil ingestion is close to 200 mg/day (EPA's Exposure Factors Handbook, 2011); the RME values for sediment ingestion used in this report ranged from 50 to 100 mg/day for adults and children, respectively.</p> <p>Third, the summary statement at the beginning of the fourth paragraph on page 7-46 is incorrect. The risk assessment approach used here did not employ upper 95% bounds or maxima for most RME assumptions.</p> <p>This section should either be removed or significantly revised to reflect these comments.</p>
156	Pages 7-46 to 7-48, Section 7.4.3	<p>This introduction to this section mentions toxicological sensitivity (i.e., some people are more sensitive to chemicals than other people), but the substantive discussion focuses on two populations that are or may be exposed under atypical conditions: homeless/transient people and residents. Transients and residents are not as groups more sensitive to chemicals; they would just face potentially higher exposures. This discussion should elaborate on which populations are deemed to be more sensitive to chemicals and explain the basis for that conclusion.</p>
157	Page 7-47, Section 7.4.3	<p>The discussion of the Homeless/Transients is speculative. At a minimum, the 3<sup>rd</sup> and 4<sup>th</sup> sentences of the second paragraph of this section should be deleted ("For example, assuming the transient...").</p> <p>For the residential discussion, the examples provided do not represent a residential exposure period of 350 days/years which would be required to evaluate these risks.</p>
158	Page 7-48 to 7-49, Section 7.4.4	<p>This section will need to be updated to reflect other comments provided herein.</p>
159	Page 7-49, Section 7.5	<p>This section overstates the degree of conservatism in the risk assessment. As noted previously, assumptions regarding media concentrations are representative of the mean, not "statistical upper-bounds." Assumptions regarding exposures are a mix of average values with values that are around the 90th or 95th percentile, not "generally representative of statistical upper-bounds." The result of combining this mix of assumptions is that the final estimate of potential exposure and/or potential risk is conservative, indeed toward the high end of the distribution of potential risks – as</p>

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		<p>intended for the RME. But the estimated risks are not expected to lie above the distribution of potential risks to people who may be exposed to the LPRSA under current and future conditions.</p> <p>EPA recommends that the first two sentences of this section be retained and the rest deleted. Note that the last sentence of this section should be deleted as it is inappropriate here.</p>
160	Pages 8-1to 8-7, Section 8.0	This entire section will need to be updated to reflect comments provided herein.
161	Page 8-1, Section 8.0	The last sentence of the introductory section should be modified as follows: The use of these assumptions results in a conservative (i.e., protective of the RME individual) assessment of human health risks for the LPRSA.
162	Page 8-2, Section 8.1.1	The discussion regarding background will need to be updated to reflect any changes that are made.
163	Page 8-2, Section 8.1.2	Please delete the first paragraph of this section. It is not necessary to repeat here.
164	Page 8-3, Section 8.1.2	<p>a. In the second full paragraph on the page, the second sentence should be revised to state, "The scenarios and exposure parameter assumptions are intended to capture exposures under both current and future site conditions."</p> <p>b. Please remove Footnote 54. It is not necessary here.</p>
165	Pages 8-4 to 8-5, Section 8.1.4	<p>In general, this section needs to be updated to reflect changes made earlier in the report. In addition:</p> <p>a. In the fourth sentence of the first paragraph on Page 8-4, the exceedances are principally driven by both TCDD-TEQ and PCBs, with lesser contributions from the other contaminants mentioned. The percentages of the risk contributed by these contaminants should be mentioned. The text will need to be revised to present this information.</p> <p>b. A table presenting the cancer risks and non-cancer health hazards that drive risk should be added to the section, with calculated risk values shown. The table and discussion should present values above the goals of protection of <math>10^{-6}</math> and an HQ = 1 or an HI = 1 for the same target organ.</p>

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		c. The text regarding background will need to be updated to reflect revisions consistent with earlier sections of the report.
166	Pages 8-5 to 8-7, Section 8-2	<p>a. Pg. 8-6: Change 170 crabs per year to “approximately 30 meals of 6 crabs per year.”</p> <p>b. Pg. 8-7: The second sentence of the last bullet on this page should be deleted.</p> <p>c. All discussion of background should be updated to reflect earlier comments provided herein.</p> <p>d. In the last paragraph of the section, the word “significantly” should be removed from the 4<sup>th</sup> sentence, and the last sentence should be deleted.</p>
167	Tables, Figures and Appendices	All tables, figures and appendices will need to be updated to reflect comments provided herein.
168	Table 3-2	Please add the following acronyms to the footnote: COPC, FSP, LRC, and RI.
169	Table 3-3	<p>a. Page 1 of 8, to be consistent with Table 3-4, please separate phosphorus from the current “inorganic” group as a separate “phosphorus” group.</p> <p>b. Page 6 of 8, please add the CAS number (91-57-6) for 2-methylnaphthalene.</p>
170	Table 3-4	Please add COPC acronyms to the footnote.
171	Table 3-8	<p>a. The qualifiers for minimum and maximum concentrations are showing multiple qualifiers for compounds listed under TPH and most of them are the same qualifier. For example, for tetracosane, n- the qualifier should be “J” instead of “J;J;;J;J”. Only one qualifier should be shown unless there are different qualifiers.</p> <p>b. The text for the location of maximum concentration for endosulfan II and Icosane were cut off. Please revise accordingly.</p>

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		c. Include qualifier "I" in footnote "(a)"
172	Table 3-9	<p>a. As stated on Page 3-9 (footnote 18), only the high resolution data were used in developing exposure point concentrations. Thus, naphthalene should not be selected as a COPC in surface water since the maximum concentration does not exceed the screening level. Please revise the necessary text and subsequent affected tables.</p> <p>b. Please confirm the maximum concentration for low resolution naphthalene result (8.5 µg/L) since this value seems to be an outlier.</p>
173	Table 3-10	Include summary statistics for arsenic, organic in Table 3-10 since the summary statistics for arsenic, organic is presented in Tables 4-25, 4-26, and 4-27.
174	Table 3-11	<p>a. Cadmium, copper, mercury, hexachlorobenzene, and pentachlorophenol are not identified as surface water COPCs; hence, they should be included in this table since it includes all tissue COPCs that are not identified as surface water or sediment COPCs.</p> <p>b. Methyl mercury is not identified as surface water and sediment COPC; hence, it should be included in this table.</p>
175	Table 3-12	<p>a. To be consistent, change "xd" to "x(d)" in the benzo(b)fluoranthene under blue crab – hepatopancreas only.</p> <p>b. As per RAGS Part A, Section 5.9.4, iron should be a COPC in surface water and sediment; thus, it should be included in this summary of COPC table.</p> <p>c. Total COPCs for surface sediment should be 32 (not including iron). Please revise accordingly.</p>
176	Table 4-1	Inhalation of vapors from sediment and/or surface water is shown as evaluated quantitatively for angler, swimmer, wader, boater, and worker. However, as mentioned on Page 4-4 and Appendix D, inhalation pathway risks are negligible. Therefore, please add to the last sentence in the "Rationale for Selection or Exclusion of Exposure Pathway" stating "however, this pathway is not considered further in the BHHRA because the inhalation pathway risks are negligible" to all receptors.
177	Table 4-3	Delete CF2 which is the conversion from hours to day for all scenarios since CF2 is not used in the intake calculation.



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178	Table 4-3	The intake equation for all dermal contact to surface water should be revised to dermally absorbed dose.
179	Table 4-4	On page 1 of 2, the row height for exposure frequency should be increased to show the rest of the rationale.
180	Table 4-6	<ul style="list-style-type: none"> <li>a. A typographic error is noted for dermal-sediment contact value for aluminum. The "(a)" should be "(c)".</li> <li>b. Add footnote "(c)" reference to the dermal-sediment contact value for antimony.</li> <li>c. The dermal-sediment contact values for DDD, DDE, aldrin, dieldrin, and heptachlor epoxide are not listed in RAGS Part E Exhibit 3-4 as noted in footnote "(c)". Instead, these values are listed in the RSL table. Please revise the footnote accordingly.</li> </ul>
181	Table 4-7	<ul style="list-style-type: none"> <li>a. Increase the row height for the footnote to show the full formula.</li> <li>b. Include the definitions of "b" and "c" used in equations A-6 through A-8.</li> </ul>
182	Table 4-8	<p>Please revise the following, and thoroughly review the entire table:</p> <ul style="list-style-type: none"> <li>a. UCL for cobalt should be 7.56 and not 8.</li> <li>b. The frequency of detection for dieldrin should be 140:142 instead of 141:143.</li> <li>c. The statistics for benzo(a)pyrene could not be reproduced. On page 3-9 footnote, the high resolution data for PAHs were used in developing exposure point concentrations. Based on this, the maximum benzo(a)pyrene concentration will be 19 mg/kg. Please verify and confirm the correct data were used in the calculation.</li> </ul>
183	Table 4-13	<p>Please revise the following, and thoroughly review the entire table:</p> <ul style="list-style-type: none"> <li>a. The frequency of detection for copper should be 39:39 instead of 34:34.</li> <li>b. The frequency of detection for dieldrin should be 31:33 instead of 32:24.</li> </ul>

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184	Table 4-16	<p>Please revise the following:</p> <ul style="list-style-type: none"> <li>a. The frequency of detection of naphthalene in Table 4-16 (38:60) does not match the frequency of detection in Table 3-9 (36:60).</li> <li>b. The maximum concentration of naphthalene in Table 4-16 (0.33 µg/L) does not match the concentration in Table 3-9 (0.069 µg/L).</li> </ul>
185	Tables 4-17 to 4-27	The frequency of detection and minimum and maximum concentrations of mercury in Tables 4-17 to 4-27 do not match the values in Table 3-10. Please make the necessary changes.
186	Table 4-17	Add subheading "SVOCs" to bis(2-ethylhexyl)phthalate.
187	Table 4-24	<p>Revise the following and make necessary corrections:</p> <ul style="list-style-type: none"> <li>a. The minimum (0.03 J µg/L) and maximum (0.33 µg/L) concentrations of heptachlor epoxide in Table 4-24 does not match the concentration in Table 3-10 (0.0018 J µg/L and 0.0024 µg/L, respectively).</li> <li>b. The selected EPC values for 4,4'-DDD and heptachlor epoxide should be maximum concentration and not mean concentration.</li> </ul>
188	Table 5-1	Similar to the Oral Cancer Slope Factor, the Chronic Oral Reference Dose for 2,3,7,8-TCDD should be used for dioxin-like PCBs.
189	Table 6-9	In the footnote, please change "10 <sup>-6</sup> to 10 <sup>-4</sup> " to "10 <sup>-4</sup> to 10 <sup>-6</sup> "
190	Table 6-12	<p>Please change the following to be consistent with Table 6-2:</p> <ul style="list-style-type: none"> <li>a. the noncancer hazard to the sitewide CTE adult wader exposed to accessible surface sediment from 0.1 to 0.09</li> <li>b. the cumulative noncancer hazard to the sitewide CTE adult wader from 0.1 to 0.09</li> <li>c. the cumulative noncancer hazard to the sitewide CTE teen boater from 0.1 to 0.06</li> </ul>

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191	Table 6-14	To revise the cumulative noncancer hazard to the sitewide CTE adolescent and adult angler from "1.0" to "1".
192	Tables 6-15 to 6-20	To fix the table header and footnote to show the $10^{-6}$ , $10^{-5}$ , and $10^{-4}$ with the proper font superscript.
193	Figure 4-1	Inhalation of volatiles in outdoor air volatilized from surface water and/or exposed mudflat sediment is shown as complete exposure pathway (marked with solid circle) for angler, swimmer, wader, boater, and worker. However, as mentioned on Page 4-4 and Appendix D, inhalation pathway risks are negligible. Therefore, please add a footnote stating "this pathway is not considered further in the BHHRA because inhalation pathway risks are negligible for all potential receptors."
194	Appendix G, Section 1.0, Page 1	The first paragraph should refer the reader to the section in the main text where lead was identified as a COPC in various media, or repeat the basis for the decision here. A brief explanation for why lead was not a COPC in fish tissue should be added.
195	Appendix G, Section 1.0, Page 1	<p>The description of the lead assessment in the fourth paragraph needs revisions to indicate that the approach looks at a specific blood lead level and include more information of the lead models for adults and children. For example, the document should indicate: The focus of the integrated exposure uptake biokinetic (IEUBK) model for lead in children is the prediction of blood lead concentrations in young children exposed to lead from several sources and by several routes. The model is a four-step process that mathematically and statistically links environmental lead exposure to blood lead concentrations for a population of children (0-84 months of age). Also, the text should clarify how the adolescent exposures were considered, i.e., which model was used for the adolescent.</p> <p>The text should also describe the goal for lead of 10 ug/dl. It should also mention that the CDC has updated their value to 5 ug/dl and that EPA is currently evaluating the updated value.</p>

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196	Appendix G, Section 2.0, Page 2, Paragraph 2	<p>Fish should not be included in the second paragraph describing exposure areas to eliminate any confusion about the exposure media evaluated in this appendix.</p> <p>It is recommended that the presentation of the average lead concentration in the evaluated media be expanded to provide the minimum and maximum concentrations identified, to put the average concentrations in context. The average concentration for surface water should also be compared to the drinking water action level of 15 ug/l.</p>
197	Appendix G, Section 2.1, Page 2, Paragraph 2	<p>The text should not characterize the RME scenario as “worst-case,” nor label the CTE scenario as “more realistic”. The first sentence of the second paragraph should be revised: “In general, the RME scenario is a high-end estimate of potential exposure while the CTE scenario uses exposure factors that are more indicative of the average.”</p>
198	Appendix G, Section 3.2, Page 3	<p>Discussion of indoor air parameters should be eliminated since exposure to indoor air is not one of the pathways evaluated for the receptor scenarios considered in this lead assessment.</p>
199	Appendix G, Section 3.3, Page 3	<p>The age range of “6 months to 6 years of age” for dietary lead intake in the second sentence seems to not match the age range presented on the figures on pages 7 and 8 (i.e., 12 months to 84 months). The age range in the text refers to source data for the Food and Drug Administration’s (FDA) average ingestion rates of lead in diet, and “6 years” does in fact include the months up to the 7<sup>th</sup> birthday. The FDA’s default dietary lead intake is 0.0055 mg/day for 6-11 month olds and 0.0058 for 1 year olds as summarized in the IEUBK Guidance Manual (EPA 1994), page 2-31. Both of the values for these age groups round to the 0.006 mg/day mentioned as the lower end of the range in Section 3.3.</p> <p>Thus the data in Section 3.3 and the figures on page 7 and 8 are actually consistent with each other. To avoid confusion, the text in Section 3.3 could be changed from “6 months to 6 years of age” to “from the first birthday to the day before the 7<sup>th</sup> birthday”.</p>
200	Appendix G, Section 3.3, Page 3	<p>The text in the third sentence should cite EPA 1994a as the basis for the assumed fractional uptake of lead. A reference for the crab ingestion rate of 7 g/day needs to be provided in the final sentence of this section.</p>

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201	Appendix G, Section 3.4, Page 3, Equation 1	Using the formula in Equation 1 for time-weighted surface water concentrations, the drinking water lead concentrations for child swimmers and waders used in the IEUBK model cannot be confirmed based on the average surface water concentration of 4.9 µg/L and exposure times and exposure frequencies in Table G-2. The text requires clarification to explain the values used.
202	Appendix G, Section 4, Page 4, Equation 2	The equations presented in this section are correct; however, $Pb_{sed}$ is not used in Equation 2 and should be removed from the list below Equation 2.
203	Appendix G, Section 4.0	The title for this section should include adolescents as well as adults. The text should also state that the adult lead model was applied to adolescents consistent with EPA guidance ( <a href="http://www.epa.gov/superfund/lead/almfaq.htm#input">http://www.epa.gov/superfund/lead/almfaq.htm#input</a> ).
204	Appendix G, Section 6.0, page 8	The discussion of the blood lead models should note uncertainties in applying the adult model to adolescent receptors ( <a href="http://www.epa.gov/superfund/lead/almfaq.htm#input">http://www.epa.gov/superfund/lead/almfaq.htm#input</a> ).
205	Appendix G, Section 6.0, Pages 8	The uncertainty section of the text should also indicate the new CDC value of 5 ug/dl that EPA is currently evaluating.
206	Appendix G, Table G-1	<p>The table indicates a maximum concentration of 2,050 mg/kg in RM 9 to 12. The information should be included in the uncertainty section as a potential outlier.</p> <p>Also, the footnotes in the table should be corrected. The table includes footnotes a, b, c, and d. However, only footnotes a and b are defined below the table.</p>
207	Appendix H	<ul style="list-style-type: none"> <li>a. The diet fraction (0.25) was not applied to benzo(a)pyrene in the cancer risk calculation for mixed fish diet. Please revise accordingly.</li> <li>b. The ADAF should be applied to children younger than 16 years, consistent with the cancer guidelines supplemental guidance (EPA 2005).</li> <li>c. The RfD for TCDD should be used for PCB-TEQ non-cancer health hazard calculations.</li> <li>d. For all tables, total non-cancer health hazard excluding total PCBs is stated as "NA". This is incorrect since other COPCs have non-cancer hazard quotient listed. Please revise accordingly.</li> </ul>

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208	Appendix I	A footnote should be added to all tables that the table presents risk drivers only (i.e., COPCs with individual carcinogenic risk greater than $10^{-6}$ and non-carcinogenic hazard quotient greater than 1) and cumulative risks, cumulative hazards, and target organ HIs may be less than shown in Table 7 series (Appendix H) and Table 9 series (Appendix I).
209	Appendix L, General	Appendix L should be reviewed in full and the approach for deriving background concentrations made consistent with that being finalized for the BERA, as appropriate. The background dataset selected should ultimately be a subset of that used in the BERA. Some of the remaining comments on this Appendix may be superseded by the final approach being developed for the BERA.
210	Appendix L, General	The text notes that only surface sediment data from within 1.4 miles of Dundee Dam are selected to represent background for this project (Dundee Dam to Interstate 80), even though sediment data further upstream (~ 13 locations for SQT purposes) were also collected. All project-specific surface sediment chemistry data collected from Upper Passaic River locations should be evaluated for incorporation into the background dataset.
211	Appendix L, Page 1-1, Section 1.0, First Paragraph	<p>a. The 2<sup>nd</sup> sentence implies that all of the sources listed in the 1<sup>st</sup> sentence are background sources, but they are not, in accordance with EPA's background guidance. Therefore, the word "background" in front of "sources" in the 2<sup>nd</sup> sentence should be deleted.</p> <p>b. The 3<sup>rd</sup> sentence conflicts with the definition of background in EPA guidance that is quoted in the 2<sup>nd</sup> paragraph of this section and it is not accurate. The sampling that CPG did would capture both anthropogenic and natural background – it was not designed to distinguish between the two, even in a highly urbanized environment. The 3<sup>rd</sup> sentence should be deleted and replaced with the definition of background in EPA's background guidance (i.e., move the definition from the 2<sup>nd</sup> paragraph to the 1<sup>st</sup> paragraph).</p>
212	Appendix L, Page 2-1, Section 2.1, Second Paragraph, Third sentence	<p>"Although some locations may appear at depths too deep for regular human access, given the potential change in water depths over time, it was conservatively assumed that all locations are potentially accessible." How is this a conservative assumption? Why is this assumption made here when it was not for the LPRSA data?</p> <p>The use of background sediment samples from depths greater than those used in the LPRSA requires justification and may not be appropriate.</p>
213	Appendix L, Page 2-3, Section 2.4, Second paragraph, First sentence	<p>"Background values were defined per COC...as the maximum detected concentration in a given data set excluding any outlier concentrations." Guidance regarding the treatment of background data emphasizes comparison of the mean concentration in background to the mean</p>

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		concentration in potentially impacted areas (EPA 2002, page 3-1). In addition, for risk assessment purposes, EPCs are derived using the 95% UCL of the arithmetic mean rather than the maximum detected concentration. Additional statistics about background data are provided later in this appendix, so it is not clear why background is defined as the maximum concentration here.
214	Appendix L, Page 2-3, Section 2.4, Second paragraph, Second sentence	The text states that outliers were identified as the 75 <sup>th</sup> percentile plus three times the interquartile range of the data distribution based on log-transformed concentrations. However, EPA's Data Quality Assessment guidance (EPA QA/G-9S, Box 2-13, Section 2.3.3) regarding outliers should be followed. The guidance recommends the use of a multiplier of 1.5.
215	Appendix L, Page 3-1	The figures in Appendix L provide part of a preliminary data analysis, as called for in EPA's Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (September 2002, Chapter 4). However, the report should also provide some interpretation of the figures in the text, rather than just present them.
216	Appendix L, Page 3-1, Section 3.0, First paragraph, Fourth sentence	"The majority of background values were identified as the maximum detected concentration of each data set." See previous comment regarding this issue on page 2-3.
217	Appendix L, Page 3-1, Section 3.1, Third sentence	"Mean and upper-bound exposure point concentrations (EPCs) were calculated..." Exposure point concentrations are typically based on the 95% UCL of the arithmetic mean (considered a conservative estimate of the true mean), rather than a simple mean from the data set or an upper-bound value.
218	Appendix L, Page 3-2, First sentence	"The EPCs...are presented in Tables L-12 through L-16." These tables present several summary statistics for the data but do not identify which were used as the EPCs in the risk evaluation. This must be clarified. This comment also pertains to statements about Tables L-20 and L-21 later in the paragraph.
219	Appendix L, Page 3-2, Final paragraph, and Tables L-22 through L-25	The phrase "(mean and upper-bound)" should be removed from the first sentence in this paragraph. Tables L-22 through L-25 should be revised: as noted in earlier comments, the "mean" scenario should be removed, and the "upper-bound" scenario should be correctly labeled as the RME scenario.
220	Appendix L, Tables L-22 through L-25	A footnote (Footnote f) on these tables gives some information about the risk estimates: "All risks calculated using RME assumptions; only EPC differs." However, there is still no explanation in this appendix about what specific statistics were used for the EPCs. The only statistic that should be used as the EPC is the 95% UCL of the arithmetic mean (or the maximum detected concentration if the 95% UCL exceeds the maximum).

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		As noted above, the “mean” scenario should be removed and the “upper-bound” scenario should be correctly labeled as the RME scenario. Footnote f should be revised to “All risks calculated using RME assumptions”.